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[ERRATUM: The cover of the JPRS report UAC-88-008, 5 August 1988, should read Soviet Union/Aviation & Cosmonautics, No 1, January 1988]

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AVIATION AND COSMONAUTICS

No 3, March 1988

Discipline, Order Seen as Key to Restructuring in Air Forces

91440069a Moscow AVIATSIYA I KOSMONAVTIKA in Russian
No 3, Mar 88 (signed to press 1 Feb 88) pp 1-3

[Article by First Deputy Chief of Air Force Political Directorate Major General of Aviation A. Sidorov: "Strengthen Discipline, Take an Active Part in Restructuring"]

[Text] The work experience of labor and military collectives and of party and public organizations in the first phase of restructuring convincingly showed that the practical implementation of the concept of accelerating the country's social and economic development and democratizing all aspects of our society's life is inseparable from the strengthening of socialist legality and law and order and the assurance of the guaranteed protection of Soviet citizens' constitutional rights, interests and personal dignity. Emphasizing the dialectical unity of these processes, CPSU Central Committee General Secretary Comrade M. S. Gorbachev notes in his book "Perestroyka i novoye myshleniye dlya nashey strany i dlya vsego mira" [Restructuring and New Thinking for Our Country and for the Whole World]: "Restructuring needs a higher degree of societal organization and citizens' conscious discipline. I will put it this way: the further restructuring goes, the more and more strictly and consistently principles of socialism must be implemented and the rules of socialist society incorporated in the Constitution and in our laws must be observed."

The important factor in the second stage of restructuring is practical work and the attainment of specific results. Hence the heightened demand for order in all sectors where the success of the matter is being decided. Discipline in the Air Force always has been the paramount factor of combat readiness, flight safety, the growth of aviators' professional expertise, and the cohesiveness of military collectives. The party line on the comprehensive strengthening of discipline and efficiency assumes special significance now when a tense military-political situation remains in the world and there are increased demands on Armed Forces' combat readiness. Elevating discipline to a qualitatively new level today means above all achieving a fundamental change in its status. That is how the question is posed by our party Central Committee and the USSR Minister of Defense.

The work experience and results achieved by commanders, political bodies, and party and Komsomol organizations of foremost Air Forces units and subunits attest that the assigned task is realistic, which means it is feasible. This is apparent in the example of aviation collectives headed by party members P. Deynekin, A. Kudryavtsev and M. Soroka, where they have proceeded further than others in resolving the problem in question.

In using new approaches to strengthen discipline, the aviators saw that the goal is achieved not by one-time campaigns or crash work, but by strenuous, painstaking day-to-day work. Maximum effect comes not so much from rigid demands and administrative pressure as from the ability of managers and party members to get themselves and the people in the mood for work, merge current and long-range tasks, tie them in with troop life, and learn timely lessons from past mistakes.

Aviators of the units where party members V. Yefanov, V. Baranov and V. Dyrdin serve carry on an active, creative search. Experience confirms the correctness of the chosen approach to improving organizational forms, overcoming inconsistency in preventing infractions, and overcoming a dissipation of efforts by commanders, political workers, and party and public organizations. It is also important that the effectiveness of contemporary work methods has been proven, such as for example the specific objective influence on eliminating negative phenomena and the long-term assignment of integrated groups of staff officers and political bodies to backward units and subunits until proper regulation order is imposed there.

When we speak of the human factor, it is quite obvious today that restructuring is activating the Army masses and uniting people more and more noticeably. In many military collectives an intolerance of stagnation and conservatism is forming; a cult of honest, conscientious military labor is being established; the responsibility of every party member and all personnel for the collective's moral atmosphere is rising; and respect is being instilled for the honor and dignity of servicemen regardless of when they were called up, their nationality, and their level of professional training. Political bodies and party organizations—above all those whose work is distinguished by freshness of views, novelty of solutions, and depth of penetration into the essence of problems—are setting the tone for positive changes.

I would like to note among the most common trends the growing role of party committees and buros of primary party organizations in ensuring party members' personal example. For example, accounts given by party members at meetings on their participation in work to fulfill demands placed by the party Central Committee and the USSR Minister of Defense on the state of discipline in the Armed Forces were widely disseminated. There was support for the initiative taken by guardsmen of the air regiment where Maj Ye. Zolotarev is party committee secretary to make a personal evaluation of party members in their party organizations and groups based on results of the latest month's work.

Execution from top to bottom and the discipline of alert duty, of flight operations, of planning and implementing combat and political training missions, and of technological processes are being brought to the foreground in assessing the state of affairs in subunits and units. Democratization of party work, glasnost, criticism, and self-criticism help normalize the situation. Here is one of the graphic displays of new thinking and actions: during meetings on restructuring the work of party organizations, party members criticized 80 percent of unit commanders and 60 percent of leaders of a higher rank for omissions in leadership of military collectives, including for ineffective work of strengthening discipline.

Taking into account that military discipline is a political and moral category, party organizations attach great significance to ideological support of the entire range of measures for its fundamental improvement. This includes an in-depth study of materials of the 27th CPSU Congress and of party Central Committee plenums; jubilee documents dedicated to the 70th anniversary of the Great October, the Armed Forces, and the Leninist Komsomol; and statements by party and government leaders on problem-oriented issues of restructuring the national economy and on ideological and political education work. It also includes other forms and methods of influence on people's minds and hearts.

There have been specific improvements in strengthening the practical direction of aviators' political training. There have been fewer general phrases and abstract discourse. More and more often, classes in many groups begin specifically with an analysis of the subunit's moral microclimate.

Meanwhile we have not yet achieved a fundamental change in discipline. It was for this reason, for example, that aviators of the collective where party members L. Stolyarov and A. Popov serve did not fulfill their jubilee socialist pledges. The commanders, political workers and personnel of the unit where officers N. Popov and V. Kovshov serve are timid in fighting nonregulation relationships, drunkenness, and thefts of fluids containing alcohol. The unit where party members V. Kozlov and F. Zhivoglazov serve is insufficiently effective in conducting prophylactic work to prevent highway transportation accidents and safety measure violations in supporting flight operations and servicing equipment. There are deficiencies in certain other units and subunits as well.

As already stated, a number of collectives have not eliminated instances of nonregulation relationships. The slow elimination of the causes giving rise to this ugly phenomenon is especially troubling: infractions of regulation order, mutual protection, and indifference to people and to their material and emotional needs and wants. Up to now there has been no broad unified front of struggle against drunkenness, this socially dangerous evil. Meanwhile it has shifted into the sphere of everyday life, where it is enormously more difficult to counter. Some managers and party and Komsomol activists even now naively assume that prohibitive acts will automatically create conditions for establishing a sober way of life everywhere.

Some political bodies and party organizations remain aloof from the work of protecting aviators' life and health and ensuring safety of military labor, although an analysis of incidents and their preconditions persuades us that much unpleasantness could have been avoided had preventive measures not been late and had strict demands been placed on those guilty of disorder without waiting for lightning to strike, as the saying goes.

Just what urgent measures are needed to achieve a radical change in the state of military discipline? Above all it would appear that every aviation collective needs to thoroughly analyze the actual state of discipline and identify weak points. It is important to understand the essence of deep-seated inner processes behind the purely external signs and manifestations. Only a comprehension of what is occurring and, based on this, a choice of specific approaches to the problem of strengthening discipline in a given unit at a given time will allow developing the most effective preventive measures. This is the key factor in strengthening efficiency.

The immediate task is to decisively change the character, content and methods of our work, and in backward units and subunits above all. Place an unconditional priority on organizational activity. Once deficiencies have been discovered, think and decide how to remedy them as quickly as possible. If there are businesslike ideas and suggestions, help the commander, a comrade or a subordinate to implement them in practice.

Political bodies and party organizations must become the initiators of an active transition to progressive methods of political influence. They are called upon to raise even higher the responsibility of every party member and every military aviator for strictly fulfilling demands of the CPSU Central Committee, which pointed out to military cadres the need to have a political attitude toward performance of military duty. The most important reserve for improving matters and strengthening order lies in the leading role of party members.

There cannot be a radical change in the state of military discipline unless we heed the lesson of truth. A departure from realism in knowing and assessing the situation verges on failure. That is what happened in the subunit commanded by Lieutenant Colonel Yu. Mishura. For a long while he and his political deputy Major V. Pavlusik obstinately "did not notice" obvious trouble in the collective. The party buro proved to be just as shortsighted and unprincipled. During an inspection of the subunit omissions were identified in the training and upbringing process through the fault of party member

managers such that it was necessary to raise the question of relieving the commander and political deputy of their positions and to impose order together with the unit command element.

To preclude similar instances every manager and party member must be deeply aware of the acuteness of the moment and consider himself a personal part of everything concerning the strengthening of discipline. An officer is obligated to be as close to subordinates as possible and show concern for the personnel's everyday life and leisure not in words, but in action. It will even be more correct to pose and resolve the problem in a broader manner—the entire tenor of Army life must be brought into strict conformity with regulation provisions and requirements.

Here is something else I would like to say. In order to normalize the moral microclimate of the barracks it is very important to remove the initiative from adherents of "dedovshchina" as quickly as possible. In this phenomenon the hypertrophied forms of juniors' respect to seniors and to the experience and merits of combat training leaders and highly rated specialists must be resolutely purged of everything alien to our morality and make them a means of educating servicemen and strengthening discipline. The success of this work depends wholly and fully on commanders, political personnel, and party and Komsomol activists and on their decisiveness and ability to genuinely organize matters and involve the maximum number of people in them.

Such general moral values as honor, conscience, duty and nobility should be given high resonance in agitation and propaganda work. The upbringing of aviators on positive examples of friendship and troop comradeship and the heroism of combat airmen and aviation specialists displayed both in a combat situation and in peacetime is of great significance. Every Air Force officer, warrant officer, NCO and private should know about the courage and military valor of internationalist pilots on whom the title Hero of the Soviet Union was bestowed for exploits in the sky of Afghanistan.

The practice of joint actions of commanders, staffs, political bodies, and party and Komsomol organizations to eradicate nonregulation relationships and other negative phenomena demands improvement. Masses of servicemen must be raised up for the campaign for the moral purity of military collectives. The methodology of phased prevention of nonregulation relationships developed by the Main Political Directorate of the Soviet Army and Navy must be adopted more actively and broadly. Its application already is producing an appreciable return in many units.

And of course we have to value and make full use of the work experience of foremost military collectives and of party and Komsomol organizations of the Air Force. For example, instances of nonregulation relationships have been eliminated in the unit where Capt S. Loktev is a party committee member. Useful experience in the campaign for regulation order has accumulated in the collective where Officer E. Zaytsev serves. In short, something can be learned and borrowed from many of the leaders.

The many-sided work of preparing to celebrate the jubilee of the Great October and the 70th anniversary of the Armed Forces and Leninist Komsomol opened up good opportunities for a further improvement in the social feeling, figuratively speaking, of military personnel and aviation collectives and for strengthening moral principles and discipline. It is important to preserve and augment the personnel's high political and labor enthusiasm and spirited mood. Socialist competition for a worthy greeting to the 19th All-Union Party Conference and the jubilee of the Soviet Armed Forces under the motto "Selfless military labor, exemplary service and supreme discipline are our contribution to the cause of the Motherland's defense" largely contributes to aviators' patriotic aspiration to give their efforts, knowledge and experience to practical implementation of the tasks of restructuring and acceleration. Work must be arranged so that the mobilizing and educating force of competition is directed at solving priority problems of developing and improving the Air Forces.

Meanwhile we have to remember that the most favorable atmosphere will have its influence on people and will work for the end result only on condition of active organizational work and the unification of our efforts to achieve a fundamental change in the state of military discipline.

Missions of major importance and complexity have been assigned to the Air Forces for this training year as well. They cannot be accomplished without a sharp improvement in discipline and order. Therefore, an increase in the responsibility of every party member and military aviator for conscientious performance of their duties assumes special importance today in the second stage of restructuring. Where each of us must begin first is always to do his or her job according to conscience.

6904

Command Flaws in Restructuring Combat/Flight Training

91440069b Moscow AVIATSIYA I KOSMONAVTIKA in Russian
No 3, Mar 88 (signed to press 1 Feb 88) pp 4-5

[Article by the Commander of the Air Force of the GSFG, Lieutenant General Aviation Ye. Shaposhnikov, Military Pilot First Class: "The Course of Restructuring: Devalued by Time"]

[Text] The force of habits and impressions formed over the years is great. This apparently is why changes in the style of our activity do not occur as quickly as we would

like. Born of the time of stagnation, the oversimplification, formalism, overcautiousness, and fear of assuming responsibility for accomplishing a difficult task continue to be an almost insurmountable obstacle in the path of accelerating progress in combat training. Alas, those are the unhappy thoughts which came to mind when I was analyzing results of the past training year.

In attending party aktivs, party member meetings and aviator conferences, one often hears approximately one and the same statement: today without new approaches and without bold, innovative solutions it is impossible to count on further forward progress toward the heights of military proficiency. It would seem that commanders' concerted orientation toward achieving high results in combat training by introducing new progressive forms of personnel training can only be pleasing, but here is the paradox: we observe an incomprehensible inertia, to put it mildly, when matters come down to implementing what has been said.

The professional training of flight crews dropped appreciably in the aviation collective headed by Officer V. Isayev. The question naturally arose: What are the reasons for that situation? People began to look into this and it turned out that in their pursuit of substantial statistical indicators the leaders of this collective considerably simplified the flight assignments for tactical application and eliminated difficult elements from them. The commanders' usual overcautiousness traditionally was camouflaged by the interests of flight safety.

Here is another example. While in charge of flight operations, former Regimental Commander Colonel I. Ivashchenko received a radio report from a crew commander that there had been a malfunction in one of the control systems aboard the aircraft. In this case the instruction treats the pilot's actions in two ways: abandon the aircraft or under favorable circumstances try to make a landing if the aircraft can be controlled.

Without much thought Colonel Ivashchenko gave the command for ejection, but the higher commander who was present in the control tower intervened in the flight operations officer's actions, contacted the pilot, and helped him make the proper decision. The pilot coped with the task and landed the aircraft safely.

In this instance two positions in life, an irresponsible one and a responsible one, collided. Fortunately the latter won.

Just why do we still have occasion to be faced so often with an abyss separating word and action? A wise old saying goes: dawn does not break because the rooster crows. Overall combat training is a very complex system. Just a functional part such as pilot training includes a multitude of measures: planning, mission assignment, decision for organizing flight operations, management and control of flight operations, study and adoption of foremost experience and so on. Naturally these problems will not be solved merely by slogans and calls for restructuring. Each component of combat readiness presumes that the heads of military collectives have professional competence, purposefulness, activeness, responsibility, imagination, and a commander's boldness.

Restructuring is an objective process. Its ideas will be realized sooner or later, but they must be realized actively each day by engaging all levers of acceleration. Every aviator, and the commander and leader above all, must take part in this.

That conclusion is confirmed by results of the work of our foremost officer-leaders. For example, for several years in a row now the aviation collective headed by Lieutenant Colonel S. Bulygin has been confidently proceeding on the right flank of socialist competition. Successes which the aviators achieved in air, weapon and tactical training largely are explained by the correct approach of the commander, political officers and staff officers to planning and organizing combat and political training. In drawing up long-range plans for the year, period and month, people here proceed from the availability of aviation equipment flying hours, the limit of fuel and ammunition, capacities of ranges and of communications and RTO [electronic support] equipment, and weather conditions in different periods of the year. This permits maintaining a constant and stable high rhythm of combat training and avoiding crash programs. The important factor, the professional training of flight personnel and combat readiness, wins out as a result.

Here is an example of a different sort. One of the subunits in the collective where Officer V. Isayev serves planned increasingly complex missions including engagement of ground targets at night using SAB [illuminating flares] and navigation bombing. It stands to reason that one subunit could not accomplish all these missions with high quality, although the personnel worked with great intensity. In the end the annual plan was unfulfilled. I believe there is no need to comment on what this means.

Unfortunately, far from all regimental and squadron commanders have yet to fully realize the demands of the time and the essence of restructuring in organizing combat training. This is attested by an acute sense of their lack of initiative and imagination and their attempt to hide organizational miscalculations behind impressive figures of flying hours and behind generalized conclusions in accounts of the work accomplished.

Meanwhile it is not general indicators that are needed now, but the specific preparedness of every pilot and navigator and of every subunit from the pair to the squadron. In my view, the principal content of the present stage of restructuring lies in a rejection of oversimplifications which have abounded in the training process up until now.

Incomplete use of the capacities of weapon ranges is one of the deficiencies frequently encountered in flight crews' practical training. For years pilots attack one and the same target from section to section with the same invariable heading. Sometimes this is dictated by air space limitations and the geographic position of the range, but often this methodolgy is the result of conservatism and some commanders' lack of desire to think and to change the customary state of affairs.

I would like to make kind mention of Officer A. Rutskoy in this regard. The subunit which he led had to make ready and depart to give international assistance in Afghanistan in a short time period. After estimating all capabilities, conditions and time, Rutskoy organized the training process so that the pilots, IAS [aviation engineering service] officers, and flight operations control group were charged up for the new job, as they say. Every aviator was placed under conditions where he had to make a decision and be responsible for it. The higher staff also had added work; under the existing circumstances it constantly had to coordinate, organize, and mutually tie up many questions. In the end, however, this had a positive effect on final results. The personnel were prepared to accomplish the difficult and responsible missions with which they later coped successfully.

Ill-conceived organization of command training does substantial harm to aviators' combat training. It leads to negative results if planned formally without considering the individual level of officers' theoretical and practical preparedness. In the unit where Officer V. Kotov serves, for example, people took an irresponsible approach to the theoretical retraining of a group of pilots in what was for them new equipment. Frankly speaking, the officers' independent training was poorly organized. No one held consultations with them. Moreover, tests given on the configuration and arrangement of the missile-armed aircraft's systems were turned into a formality. Pilots were authorized for flight operations without even having had their professional level studied properly.

Atonement for the negligence came quickly. One of the officers, who did not have sufficient experience of flying in the clouds and who had not thoroughly learned the features of his aircraft, committed a serious error on the landing approach. As a result the aircraft was substantially damaged, and this with a military pilot first class in the cockpit!

Here I would like to dwell on features of training first class pilots. The fact is that a pilot's active professional growth is observed for the first 5-7 years after completing school, i.e., until he receives the first class pilot title. For several years after that he exists on the old store of knowledge. On the whole, a reverse process sets in 10-12 years later. Some pilots begin to erroneously assume that they have achieved everything and there is nowhere further to go. They cease to work on themselves professionally. This is also manifested both in a poor quality of tactical application and in erroneous actions right down to preconditions for incidents.

Advanced flight training programs have been provided to avoid this. Some commanders, however, do not strive to improve the professional level of their first class pilots inasmuch as this demands additional efforts, reflections, and certain organizational and methods decisions. Others simply await pressure from above.

The quality of flight control and flight safety hold a special place among the multitude of problems which air commanders have to resolve when organizing combat training. In connection with this I would like to draw attention to the following aspect. The progress of science and technology in recent years led to broad introduction of sophisticated technical equipment in the system for controlling crews on the ground and in the air. This unquestionably introduced adjustments to the process of training and practices for flight operations control group (GRP) personnel. Nevertheless, the person at the console continues to play a deciding role.

Despite the use of various simulators and trainers for training and for improving the skills of flight operations control group members, their capability and effectiveness clearly are insufficient. Modern simulator complexes (TMK) based on computers presently have been created for simulating any air situation, complicating or simplifying it as desired, changing the parameters of aircraft flight paths in real time, introducing various interference, changing weather conditions and so on in the interests of flight operations control group training and practice.

Even the small amount of practical experience in operating the simulator complexes shows that while they are being used successfully for solving some specific problems, they have an insufficient load for realizing integrated problems, especially with the control group at full strength and with the inclusion of commanders and staff officers.

It is not just a matter of objective reasons caused by complexity of organizing practices of command personnel and the flight operations control group in a period of intensive flight operations where every person is accounted for and it is difficult to break him or her away from performing immediate duties even for a day. There is a multitude of subjective reasons involving, for example, insufficient computer competence of individual officials, the timidity of some commanders when faced with computers and modern simulator complexes, and finally simply a mistrust shown by both categories of personnel toward computers and their capability of easing the work of the officer/manager, pilot, navigator and operator even if only partially.

Today a person who hopes to get by in military affairs without a computer falls into dangerous illusions. Mastery of computer equipment is an imperious demand of the times and has to be reckoned with.

In the presently existing system of centralized Colonellection of data on combat training progress, even now we can identify divisions in automating the processes of planning, accounting for, and analyzing combat training elements; forecasting and assessing the level of flight personnel training; and a number of other questions.

New approaches are needed toward using the capabilities of the simulator complexes. Inputs of efforts and resources for their complete mastery are repaid a hundredfold. We have to ponder right now without delay how to give not only the representatives of control groups but also officers of staffs, flight services, command posts, tactical control, ground controlled intercept and so on access to this important work.

The present stage of restructuring is a time of specific vigorous actions for the sake of effective practical results. The questions raised are only a small part of that enormous work which has to be done in the interests of increased effectiveness of combat training, a growth in aviators' professional training, and an improvement in their air, tactical and weapon proficiency without which it is senseless to speak of assuring guaranteed Air Forces combat readiness and combat effectiveness. The work style of commanders based only on blind, thoughtless fulfillment of directions "from above" has been discounted by time.

6904

Military Aviation-Technical School Training Deficiencies

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No 3, Mar 88 (signed to press 1 Feb 88)pp 8-9

[Article by Major General Aviation L. Kosnyrev, chief of Vasilkov Military Aviation-Technical School imeni 50th Anniversary of Leninist Komsomol of the Ukraine: "From the Life of the Higher Educational Institutions: Obsolete Forms and Firmness of Essence"]

[Text] The problem of training highly qualified specialists who support the combat readiness of complex aviation systems makes itself known more and more acutely with the entry into air units of new aircraft outfitted with modern technology. Comments from units about our graduates note that a gap is apparent between the intellect of the person who readies the aircraft for flight and the complexity of the aircraft's on-board systems. While lack of knowledge of an experienced technician is compensated to some extent by solid experience in maintaining an aircraft of a previous generation and by firm skills, the young specialist is faced with many problems with which he is incapable of coping independently.

There are many reasons for this situation. In my view the principal one is that there are serious miscalculations in the military aviation-technical school's training process. For example, an analysis of comments received about our alumni over the last five years showed that a fifth of them contain direct reproaches from aviation engineering service heads for the insufficient practical direction of training. In their opinion, in their initial period of service some young officers experience many difficulties in servicing equipment when performing even elementary operations, not to mention accomplishing some kind of complex tasks of engineering and logistic support.

Frankly speaking, this is a defect in the work of our command and instructor personnel, but where does it arise? In my view, the chief factor is that a faulty system took shape over many years for assessing the effectiveness of work by aviation-technical school commanders and instructors not according to the quality of our graduates' knowledge but according to the number of officer-technicians graduated. Hence the "justified" principle of the mentors' work: out of sight, out of mind.

I am thoroughly convinced that under conditions of a radical training reform all complaints of young officers' insufficient training have to be referred to the specific instructors and commanders who allowed this defect. The very format of comments from the troops has to be revised for this purpose.

It would appear more appropriate to assess a graduate's practical preparedness not in general, but specifically: his knowledge of the operation and design of the aircraft, engine and other systems. This will permit remedying shortcomings in the training process more promptly and, of great importance, seeing more clearly who among the instructors and commanders is performing incomplete work and in what area.

We began restructuring the training process by analyzing deficiencies. It turned out that the most substantial deficiency was the self-complacency of command and instructor personnel. This complacency was based on the school personnel's exaggeration of the enthusiastic performance appraisal given by higher echelons, and it led to a situation where curricula were copied from year to year and no one worked on them creatively. Such negative phenomena as formalism, ostentation, and falsification of accounts sprouted abundantly in this soil.

A comprehensive inspection of the cycles headed by officers A. Khvorost, G. Koptsov and P. Mishchenko showed that instructors of maintenance disciplines had a poor knowledge of reasons for mistakes of technical

personnel which led to flight incidents in the Air Forces. But where were they to get this knowledge when many instructors used lesson plans five or even ten (!) years old and did not take a look at information documents? The work of officers V. Slinko, A. Postnikov, V. Peredereyev and Yu. Yevtikhov was deemed unsatisfactory.

The work of some subunit commanders also did not meet the demands of the time. Majors A. Dubatovka, P. Shumovskiy and V. Pilipenko essentially removed themselves from individual upbringing work with cadets. As a result the cadets' success rate dropped and military discipline also deteriorated in these collectives.

It was difficult to overcome the people's adherence to ostentation and self-admiration which had become rooted over the years. Many instructors, for example, were fully suited by the external luster on the training airfield. Meanwhile the upkeep of the airfield training facility prevented preparing aviation specialists to the full extent and with high quality for many years. Only the engines of aircraft in which cadets learned to perform necessary jobs were kept in a normal condition. Thus physical assets and training time often were spent for nothing and the young specialists did not receive firm skills in preparing aircraft.

It was necessary to take cardinal measures to get rid of the serious deficiencies. First of all we revised the curricula. A number of topics of the majority of technical cycles were radically revised. Nevertheless the first steps did not produce the expected positive result. The passiveness of instructor personnel and their habit of working halfheartedly were a brake on the new approach.

It is typical that no one spoke out openly against the innovation. To the contrary, almost all instructors outwardly became more active and spoke heatedly at every conference about the novelty of tasks and the urgent need to restructure the training and upbringing process, but when it was necessary to shift from words to action many preferred to remain aloof from solving urgent problems. The essence of that situation was that these officers simply did not wish to complicate their lives. Those who sincerely wanted to restructure did not know specifically what to undertake or where to begin.

In the situation at hand the school command element and political department first of all decided to increase the activeness of chiefs of cycles and senior instructors. For this they began to analyze the preparation of instructors for classes more thoroughly, provide them with necessary literature on a timely basis, and familiarize them with guidance documents coming from the Air Force Main Staff concerning the Aviation Engineering Service. They placed stress on teaching the training material with consideration of the future. We thereby wish to see to it that our graduate is prepared at the level of a technician who has served two or three years in a regiment.

In connection with an improvement in the training process we were acutely faced with the problem of developing the cadets' love for the profession of technician, the real proprietor of the aircraft. This is not an idle question. Frankly speaking, up until the recent past the school training of future aviation specialists was arranged in isolation from problems existing in the troops, and one did not sense the spirit of combat air units in it. Concern for the evaluations of our alumni and for the average grade often dominated our conferences, and the question of specifically just what kind of graduate was needed by the air regiment was almost never raised.

An analysis of deficiencies in the training and upbringing process placed us face to face with the need to revise the work style of officers in strengthening military discipline among cadets. It turned out that this important sector of educators' activity is most subject to formalism. Rigid administration by injunction often was substituted for individual upbringing work with people. The erroneous nature of such an oversimplified if not primitive approach to the very complex and responsible job of educating people was confirmed by infractions of military discipline committed by Colonel V. Yakimenko's subordinates. The fact that cadets of subunits headed by Majors V. Teplyashin, V. Teslenko and V. Ivanov demonstrated poor knowledge in state exams on USSR Armed Forces regulations also forces a great deal of thought.

The transition to training under new training plans and curricula made it necessary to reject the gross-numbers approach in evaluating knowledge and forced us to get rid of the mania for percentages and other numerical indicators which did not allow seeing the true state of affairs.

Last year with the immediate participation of Colonel Yu. Malinin, the training department developed a new "Methodology for Evaluating the Work of Instructors" and the "Statute on Certification of Work Stations." These documents strictly regulate instructor activities and monitor the prompt generalization and dissemination of foremost experience of the best mentors.

A question is quite likely here: Why place an instructor in such a rigid framework, for he needs freedom for creative work? That is just what we are striving for. Strict regulation of activities of commanders and instructors is needed so that they not only become more active, but also seek unused reserves. Instructors' adherence to extensive work methods and their habit of solving problems by using additional capacities or by direction from above is still very strong. I will cite an example to confirm this.

Certification of instructor personnel work stations conducted at the school showed that many officers such as Lieutenant Colonel A. Pyanov and majors S. Snezhko

and N. Martynov displayed no small amount of inventiveness, initiative and zeal to improve the effectiveness of the training process in their sector. At the same time the commission expressed many complaints about formalization of work stations of officers A. Merzlikin, Yu. Valerianov, A. Rudas, V. Ishchenko and others. And what happened? Instead of drawing correct conclusions, these officers made excuses that they didn't know where to get the materials and gave other similar "objective" reasons.

A view toward improving results and effectiveness of pedagogic activity obviously is not compatible with dependence on others. We will wage a resolute and uncompromising campaign against that position for the sake of improving cadets' professional training. We cannot be satisfied by a training facility created according to yesterday's demands. Bringing it up to date is a task not only of the school command element, but also of all officers having anything to do with the training process.

We are especially troubled by the outfitting of the training airfield. In our opinion it must duplicate an operating airfield in miniature. The work of creating an aviation weapon preparation pad, a technical maintenance unit with all laboratories, emergency team work stations with all necessary equipment, and so on now has begun for this purpose. It is also planned to create special simulators allowing cadets to hone their skills to perfection.

In short, there is work to be done, but both progressive and obsolete training forms are operating in this transitional period. The problem is that this difficulty must be overcome—we have to resolutely reject obsolete forms. Only the essence of the matter remains firm: troops must be augmented by highly trained specialists. This is a demand of today and of tomorrow.

6904

Rules of Acceptance in Air Force Schools

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[Article by Colonel M. Buchilin, Air Forces Higher Educational Institutions Directorate: "For the Youth About Air Forces Schools"]

[Text] In submitting a request to the military commissariat for entry into a particular military aviation school, some young people have a vague idea of what specialty they will study, whether or not it conforms to their desires and, most important, whether or not they themselves have the psychophysiological qualities needed for this profession.

Aviation specialists can be placed together in the following groups: pilots and navigators of various air arms; engineering-technical personnel for maintenance and repair of aircraft, engines, aviation armament, and aviation and electronic equipment; air traffic control officers and officers of the meteorological service; and aviation rear specialists.

Consult with military commissariat personnel before signing a request for entry into a school. To preclude mistakes in choosing a military profession, it is best to write a letter to the school, where a precise, qualified answer will be given.

Some graduating students assume that by entering a school where competition allegedly is lower they will be able to transfer in the course of studies to the one which they desired to enter but where they did not make it (or had no hopes of making it) through the competition. Frankly speaking, this is a blunder. A transfer is possible only from flight schools to engineering and technical schools when a cadet cannot continue flight training for reasons of health. In other cases a transfer is impossible since curricula differ in different higher educational institutions.

The high demands on entrance exams, the competition, and the entire set of measures permitting a determination of a young man's level of preparedness for school training is a stern necessity. Sophisticated equipment and assurance of our country's high defensive capability demand thorough theoretical and practical professional preparedness of the people who attend to and operate aviation systems.

Many letters are received by our aviation higher educational institutions and corresponding organizations in which parents and young men who have received basic flight training in DOSAAF aviation sports clubs ask questions and often express reproach that specific funds were spent on their training in the air club but they were not accepted in a military aviation school for pilots.

It must be said that in each instance there is a very specific reason why a young man was refused acceptance to his chosen school. Most often it is that his state of health is medically inadequate for demands of the military higher educational institution and he has poor knowledge in general educational training at the secondary school level. Some young men with an enviable desire and determination to become a pilot do not commensurate their desire with the actual state of their health. They stubbornly insist, casting doubt on the decisions made by the school medical commission specialists. This confidence is based on the fact that they were deemed fit for flight training in a sports aircraft when they joined the air club.

That situation usually arises in two instances: either at some stage the young man did not attach special significance to the consequences and was able to "hide"

deviations in his health, or a medical specialist met the youth's desire to fly by not making a prognosis in the development of an ailment. I do not conceive of the unconscientiousness of a physician who would deliberately not notice deviations in a young person's heatlh.

With respect to general educational training, some youths explain their weak knowledge by saying that by being involved in the air club they had no opportunity to devote sufficient attention to school studies. But if a young man had an unconscientious attitude toward academics and has poor knowledge, how does he figure to master the large volume of complex theoretical disciplines of a military school?

Air Force schools accept servicemen who are on active military duty in the USSR Armed Forces; reservists who have served a term of active military duty; civilian youths; and graduates of Suvorov military schools and the Nakhimov Naval School who have a secondary education. Warrant officers are not accepted in aviation technical schools. They can take exams for a secondary military educational institution as an extramural student. Girls and reserve officers also are not accepted in military aviation schools.

Warrant officers and extended-term servicemen are accepted in school at the expiration of two years of service in positions of warrant officers, extended-term servicemen, or officers. The term of service is calculated as of 1 September of the year of entrance.

The age of those entering schools must not exceed 23 years for warrant officers, extended-term servicemen, and reservists released to the reserve after performing first-term service. The age for civilian youth, first-term servicemen, and Suvorov and Nakhimov cadets must not exceed 21 (as of 31 December of the year of entrance). Candidates from the civilian youth must not be younger than 17 years.

First-term servicemen wishing to enter a school submit a request to the military unit commander through channels prior to 1 April of the year of entrance for studies. Military unit commanders submit the documents specified by entrance rules to personnel organizations of large units [soyedineniye]. Subsequently, given positive decisions by the selection commissions, the documents are sent to appropriate personnel organizations prior to 10 April of the current year.

Documents on servicemen performing duty in establishments, schools, subunits and units of any combat arm not organizationally part of a large unit also are sent to these same organizations. The staff members of personnel organizations must know precisely in which acceptance commission (at a school or in a traveling commission) servicemen are to undergo final professional selection. This is established for each year by an appropriate order of the USSR Minister of Defense. Each year we have to examine applications of candidates in which they announce that they were not called to undergo professional selection because documents were not submitted to the appropriate acceptance commission. Resolution of the question about a serviceman's entry to a school for training depends on precise work of staff members of personnel organizations.

Civilian youths submit applications to the rayon (city) military commissariat at their place of residence prior to 15 May of the year of entrance. Appended to the application are an autobiography, a reference from place of work or study, a Komsomol reference, a copy of the document on secondary education (or information on current progress), and three photographs (4.5x6 cm). Candidates often submit complaints that an application for entry into their chosen military educational institution is not being accepted from them because it is not in the allocation or because they have reached draft age and are subject to call-up for first-term service. A candidate is given the right to submit an application and indicate the educational institution which he wishes to enter regardless of the presence of this military educational institution in the allotment for selection of candidates for the given military commissariat. Persons who have reached draft age and who wish to enter a military school are considered candidates for entrance to military educational institutions.

Civilian youths take entrance exams and are checked in all other divisions of professional selection directly in the chosen schools. Candidates are given free rooms and meals for the period of professional selection.

Professional selection in the final stage is done by a comprehensive evaluation of each candidate. In addition to exams in general educational disciplines (mathematics, physics, Russian language and literature, USSR history), the youth's physical fitness is checked and evaluated to the extent of requirements of individual norms of the USSR GTO [Ready for Labor and Defense] complex and the military sports complex (100 m dash, pull-ups or backward flip on the horizontal bar, 300 m crosscountry race, and swimming). The state of health is evaluated with consideration of psychological data needed for training in a military educational institution and mastery of the chosen military specialty. No small significance is attached to the candidate's sociopolitical activeness and moral qualities. A geography exam is given in place of a physics exam in the Kurgan VVPAU [Higher Military-Political Aviation School].

The acceptance commission makes an overall finding as to the advisability of enrollment in school on the basis of a comprehensive evaluation of all professional selection indicators. Indicators for all divisions of the check are equivalent, but the direction of the personality and its psychological characteristics for mastering the chosen specialty, especially a flying specialty, are of determining importance.

Candidates' psychological data are checked under special methodologies using tests and equipment.

Candidates can become familiar with the comprehensive personality evaluation methodology during professional selection from the school acceptance commission. A generalized indicator (M), which can take values in relative units within the range from 0.012 to 1.0, has been chosen to compare each variant of grades received by a candidate in all divisions of the check. Two candidates can have equal generalized indicators and be accepted in the school. In this case, for example, the higher psychological data and physical fitness with a lesser average figure for general educational disciplines of one candidate compensate for a higher average figure received in exams by another candidate with poorer psychophysiological indicators. In other words, it is not only high grades in theoretical disciplines that are a determining indicator in entering a military aviation school, as many candidates are accustomed to believe, but also sufficiently high grades in all other professional selection categories.

School acceptance commissions for professional selection operate from 10 through 30 July.

The following are enrolled in military aviation-technical schools without verification of knowledge in general educational subjects, but with conformity to all other professional selection requirements (sociopolitical activeness and moral qualities, state of health with consideration of psychological data, physical fitness), and those with psychological data in group 1 also are enrolled in schools for pilots and navigators, as follows: Heroes of the Soviet Union and Heroes of Socialist Labor; persons awarded USSR orders and medals (Valor, Ushakov, Combat Merit, Nakhimov) for distinction in combat actions in defense of the USSR and performance of international duty; graduates of Suvorov military schools and the Nakhimov Naval School; and persons who finished secondary schools with a gold or silver medal, or secondary specialized educational institutions with an honors diploma.

On entering higher aviation schools persons awarded a gold or silver medal on completion of secondary school or who completed a secondary specialized educational institution with an honors diploma take only one exam (in the profiling discipline) as determined by the chief of the military educational institution (except candidates entering schools for pilots and navigators and having professional psychophysiological data in group 1). They are exempted from further exams on passing the exam with a grade of outstanding, but they take exams in the other disciplines as well on receiving grades of good or satisfactory.

Students who completed the first course or subsequent courses of civilian higher educational institutions in specialties corresponding to the profile of a given military school can be enrolled in the first course of higher and secondary aviation schools without a check of knowledge in general educational subjects (but with conformity to all other indicators of professional selection) after an interview. These candidates take exams on a universal basis if the profiles are incompatible. The chairman of the acceptance commission makes the decision for conducting an interview or giving exams.

The following are accepted to schools outside of [the normal] competition based on results of professional selection on receiving positive grades in general educational disciplines: servicemen who displayed high moral-combat qualities in defense of the USSR and in performing international duty; first-term and extended-term servicemen who are outstanding in combat and political training and are announced in a military unit order; extended-term servicemen are accepted in military aviation-technical schools. Recommendations for non-competitive acceptance are submitted by professional selection commissions in districts and groups of forces, which is indicated in professional selection cards.

The term of training in aviation schools for pilots and navigators is 4 years, in engineering schools it is 5 years, and in technical schools it is 3 years. Military school cadets are provided with all allowances and during the time of training they are given a two-week vacation and a month's leave annually. Those completing school are given the military rank of lieutenant, presented with a union-wide type diploma with conferral of the appropriate qualification, and given a badge.

The following schools announce acceptance of cadets to the first course:

Kacha Order of Lenin, Red Banner Higher Military Aviation School for Pilots imeni A. F. Myasnikov (400010, Volgograd, 10).

Kurgan Higher Military-Political Aviation School (640025, Kurgan, 25, Kurgan Oblast).

Chernigov Higher Military Aviation School for Pilots imeni Leninist Komsomol (250003, Chernigov, 3).

Kharkov Order of Red Star Higher Military Aviation School for Pilots imeni Twice-Honored HSU S. I. Gritsevets (310028, Kharkov, 28).

Borisoglebsk Order of Lenin, Red Banner Higher Military Aviation School for Pilots imeni V. P. Chkalov (397140, Borisoglebsk, 2, Voronezh Oblast).

Barnaul Higher Military Aviation School for Pilots imeni Chief Mar Avn K. A. Vershinin (656018, Barnaul, 18).

Tambov Higher Military Aviation School for Pilots imeni M. M. Raskova (392004, Tambov, 4).

Orenburg Red Banner Higher Military Aviation School for Pilots imeni I. S. Polbin (460014, Orenburg, 14).

Balashov Higher Military Aviation School for Pilots imeni Chief Mar Avn A. A. Novikov (412340, Balashov, 3, Saratov Oblast).

Syzran Higher Military Aviation School for Pilots imeni 60th Anniversary of the USSR (446007, Syzran, 7, Kuybyshev Oblast).

Saratov Higher Military Aviation School for Pilots (410601, Saratov, 1).

Ufa Higher Military Aviation School for Pilots (450016, Ufa, 16, Bashkir Oblast).

Voroshilovgrad Higher Military Aviation School for Navigators imeni Donbass Proletariat (348004, Voroshilovgrad, 4).

Chelyabinsk Red Banner Higher Military Aviation School for Navigators imeni 50th Anniversary of the Komsomol (454015, Chelyabinsk, 15).

Voronezh Higher Military Aviation Engineering School (394064, Voronezh, 64).

Kharkov Higher Military Aviation Radio Electronics School imeni Leninist Komsomol of the Ukraine (310165, Kharkov, 165).

Irkutsk Order of Red Star Higher Military Aviation Engineering School imeni 50th Anniversary of the Komsomol (664036, Irkutsk, 36).

Tambov Order of Lenin, Red Banner Higher Military Aviation Engineering School imeni F. E. Dzerzhinskiy (392006, Tambov, 6).

Kharkov Red Banner Higher Military Aviation Engineering School (310048, Kharkov, 48).

Achinsk Military Aviation-Technical School imeni 60th Anniversary of the Komsomol (662100, Achinsk, 1, Krasnoyarsk Kray).

Vasilkov Military Aviation-Technical School imeni 50th Anniversary of the Leninist Komsomol of the Ukraine (255130, Vasilkov, 3, Kiev Oblast).

Kaliningrad Military Aviation-Technical School (236044, Kaliningrad, 44, Kaliningrad Oblast).

Kirov Military Aviation-Technical School (610041, Kirov, 41, Kirov Oblast).

Lomonosov Military Aviation-Technical School (188450, Lomonosov, Lebyazhye Settlement, Leningrad Oblast).

Perm Military Aviation-Technical School imeni Leninist Komsomol (614049, Perm, 49).

6904

Aircraft Handling at Large Angles of Attack

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[Article by Hero of the Soviet Union Colonel G. Pukito, Honored Test Pilot USSR, and Colonel Yu. Illarionov, Test Pilot: "For the Pilot On Practical Aerodynamics: When Large Angles of Attack are Necessary"]

[Text] Conditions can arise in air combat where a pilot will have to "squeeze" everything from an aircraft of which it is capable. In other words, he will have to handle the aircraft at large angles of attack and large g-loads.

Angles at which flow separation zones form on some parts of the aircraft, qualitatively altering the nature of flow-around and the aircraft's aerodynamic characteristics, are called large angles of attack.

Configuration features of modern maneuverable aircraft led to features of stability and controllability characteristics which substantially complicated the aircraft's lateral movement and control at large angles of attack. What is meant here above all is low directional stability, high roll stability, considerable yawing moments with lateral controls deflected, and the large difference between centroidal moments of inertia J_y-J_x and J_z-J_x.

The lateral motion of a modern aircraft is characterized by the fundamental interrelationship of roll and yaw motions from deflection of lateral and directional controls and from the effect of turbulence, as well as by a substantial interaction of lateral and longitudinal motions. The situation is considerably complicated by the fact that a pilot with his inherent dynamic and psychophysiological qualities is in the control loop, which must be taken into account in studying questions of handling aircraft.

Slip angle derivatives of aerodynamic coefficients of roll and yaw moments as a function of the angle of attack are given as an example (Fig. 1). An approximation of the slip angle derivative of the roll moment with a given Mach number can be obtained the first approximation if we introduce the relationship:

$$m_x^\beta = m_{x_0}^\beta + \frac{\delta m_x^\beta}{\delta \alpha} \cdot \alpha,$$

where:

$m_{x_0}^\beta$

is the value

m_x^β

at an angle of attack equal to zero.

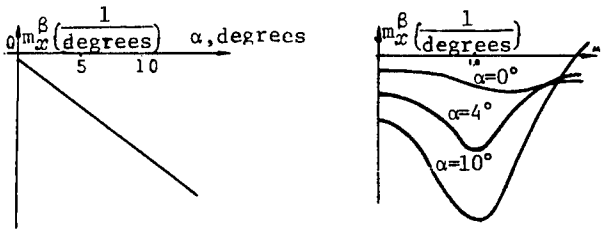

Fig. 1. Roll moment coefficients as a function of angle of attack and Mach number

Lateral stability and controllability deteriorate and a stall becomes possible with decreased speed and increased angle of attack.

The problem of ensuring lateral controllability of maneuverable aircraft at large angles of attack and effectiveness of lateral control requires special attention. The fact is that with an increase in α the effectiveness of lateral control decreases and with a deflection of control surfaces fluctuations appear in the rate of roll. The pilot may provoke excessive rolling of the aircraft in parrying these fluctuations (precision depends on aircraft handling techniques). With increased angle of attack these fluctuations increase and a so-called roll hang-up appears which the pilot perceives as loss of lateral controllability. Total loss of lateral controllability sets in at a certain angle of attack, with the threat that the aircraft will stall "through the will" of the pilot. It stands to reason that it is inadmissible to enter into that angle of attack.

Let us examine the features of a maneuverable aircraft's behavior at large angles of attack. The wing's lifting properties and longitudinal motion stability are preserved approximately to angles α of about 30 degrees. In some aircraft the reason for a limitation in angles of attack is a decrease in directional stability with an increase in α, as a result of which there is a drop in lateral controllability with the aircraft's steady-state roll rotation.

With increased angle of attack the aircraft's directional stability drops and there is an increase in lateral stability and in unfavorable yawing moments from the deflected lateral controls. Slip angles which arise also increase in connection with this. Therefore the magnitude of steady-state rates of roll drops (Fig. 2).

Along with ailerons, differential deflection of the stabilizer (stabilizer scissors) is used on modern aircraft to improve lateral control. The sign of yawing moments depends on the aircraft's angle of attack and on the trim position of the stabilizer in pitch.

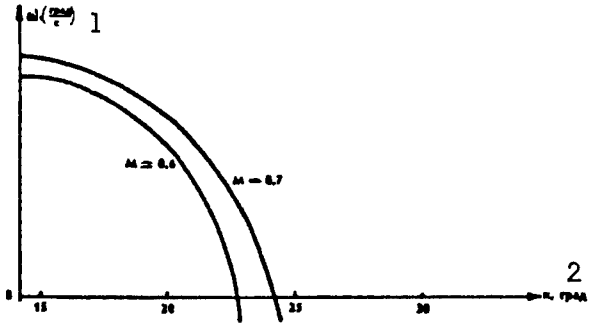

Fig. 2. Steady-state rates of roll as a function of angle of attack at different Mach numbers

Key:
1. Degrees/second
2. Degrees

In addition to the controlling roll moments, unfavorable yawing moments arise with deflections of ailerons and stabilizer at large angles of attack; this causes slip, retarding the aircraft's roll rotation due to the effect of rolling moment

$M_x^{\beta}\beta$.

Its magnitude is proportional to the slip angle. The greater the yawing moment and the less the directional stability

m_y^{β},

the greater the slip angle (on a dropping half-wing) (Fig. 3).

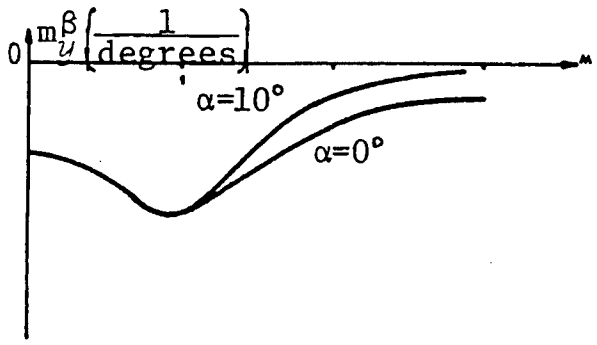

Fig. 3. Slip angle as a function of directional stability coefficient and Mach number

With decreased directional stability at large angles of attack and an increase in lateral stability and unfavorable yawing moments from deflected lateral controls, the slip angles which arise retard the aircraft's rotation created by deflection of the differential stabilizer in roll. This also is one of the reasons for decreased effectiveness of lateral control at large angles of attack.

At certain angles a "hang-up" of the aircraft in roll may occur, manifested by the fact that with the control stick deflected for roll the rate of roll may become equal to zero and with a further increase in angle of attack it may even change its sign. If the additional rolling moment from the slip is greater than the controlling moment the aircraft will begin to rotate to the other side. A reverse roll reaction to deflection of the control stick for roll arises in this manner. It should be noted that the aircraft's angle of attack may change additionally depending on the rate of roll (with control stick position unchanged in pitch) because of the kinematic and inertial interaction of lateral and longitudinal motions. An additional increment of the angle of attack may be $\Delta\alpha$=3-4 degrees in fighter aircraft at

$V_{пр} = 500—600$ км/hr

with the aircraft rotating at an angular velocity of 50-60 degrees per second.

Structural arrangements are used to increase flight safety when handling an aircraft close to permissible angles of attack; they provide sufficient effectiveness of lateral control by extension of leading-edge flaps as well as by specially profiled extensions in the wing root and automatic control of wing nose flaps depending on angles of attack, roll and slip when executing a three-dimensional maneuver.

In addition, automatic control systems are being developed and used with positive deflection of controls preventing the aircraft from being placed at dangerous angles of attack. There is also a constant search for rational aircraft handling techniques at large angles of attack.

The experience of operating modern aircraft gives us the right to share certain recommendations with pilots mastering this equipment which in our view can be useful. Above all it is necessary to have a precise knowledge of the flying restrictions of a specific type of aircraft and a good understanding of their physical essence. If an aircraft has warning signs for approaching a critical angle of attack (nose movements, vibration, buffeting), this should serve as an acute signal for the pilot: Take steps! In this case the maximum permissible value of C_y should be taken as equal to its value at the moment aerodynamic buffeting begins:

$C_{y\,доп} = C_y$ buffeting (vibration)

In the absence of natural warning signs, monitor the magnitude of the angle of attack by instrument with a frequency dictated by the nature of the maneuver, also using special light, sound, and tactile signals.

In case angle of attack restrictions are input to the aircraft automatic control system, the pilot has no right to overcome the forces being applied to the control stick by the system, but must handle the aircraft at the limit of the system's actuation. When there is a vigorous increase in the angle of attack, ceasing to pull the stick in or even shoving it away may not prevent an exceeding of the permissible value of

$\alpha_{доп}$,

since the change in angle of attack is late with respect to stabilizer deflection.

Therefore in conducting air combat one must handle the aircraft vigorously but not abruptly, not forgetting the recommended rate of creating a g-load. Abrupt, disproportionate, uncontrolled movements of the controls are still impermissible when a pilot is forced to handle the aircraft vigorously. In the most extreme case one can deflect control surfaces stepwise, gradually approaching maximum values of aerodynamic characteristics, but without fail in a strictly coordinated manner and with a margin for error. That aircraft handling technique must be persistently learned in simulator and actual flights.

6904

Aborting a Take-Off in a Jet Aircraft

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[Article by Colonel V. Yevgrafov, military pilot-sniper, and Colonel N. Nosov, candidate of technical sciences: "Flight Safety: Analysis of Prerequisites: Special Situation at Take-Off"]

[Text] The take-off of a modern jet aircraft is an important stage of a flight assignment. Its transient nature and the length and time of the take-off run dictate the tempo at which the pilot handles the combat aircraft and consequently the degree of the combat pilot's stress in the given leg of the flight. High accelerations (a take-off on afterburner or with boosters), allocation of attention to space outside the cockpit, and rapidly changing information on operation of the aircraft's systems and power plant not only force the pilot to work at a fast pace, but also create certain physical and psychological difficulties.

Supreme composure and precise, consistent actions also are demanded of a pilot in having to abort a take-off. A combat pilot has no fear of a nonroutine situation if he has good skills in the techniques of handling an aircraft and a strong will. There are many instances, however, where an aborted take-off resulted in gross infractions of flight safety rules.

During a pair's take-off the tire on the left main landing gear wheel blew on the aircraft of wingman Lieutenant V. Miniyarov. The flight operations officer did not notice the trouble right away and was late giving the pilot the command to abort take-off. In the situation at hand the lieutenant acted indecisively and committed errors. As a result the aircraft rolled off the runway and was damaged. The situation would have been considerably simplified had the pilot or the flight operations officer made the correct decision in time. Unfortunately the aviators had not been properly trained for this.

Another time 1st Class Military Pilot Major S. Ageyev did not shut down the engine after the decision was made to abort take-off, but placed the engine control throttle on "Idle." Both tires on the main landing gear wheels blew as a result of using the emergency braking system.

Flying practice indicates that in a number of cases even experienced instructor pilots commit errors in aborting a take-off.

An analysis of similar preconditions for flying incidents shows that these miscalculations arise because of a poor knowledge of the aircraft's features, of acceleration and braking characteristics, and of the physical essence of the power plant's automatic fuel-metering equipment operation, and because of poor quality of simulator training for actions in special flying instances.

Let us examine features of a pilot's work in aborting take-off on the take-off run as applied to front aviation aircraft. We should remember that the take-off run of a modern aircraft with a large thrust-to-weight ratio is characterized by a significant longitudinal g-load n_x. As a rule the aircraft's take-off weight exceeds its landing weight, which leads to increased length of the run when aborting a take-off on the take-off run.

After the decision has been made to abort a take-off on the take-off run and the engine control throttle has been shifted from the afterburner position to "Idle," a reduction in power plant thrust (turbocompressor rotor rpm) occurs with a delay

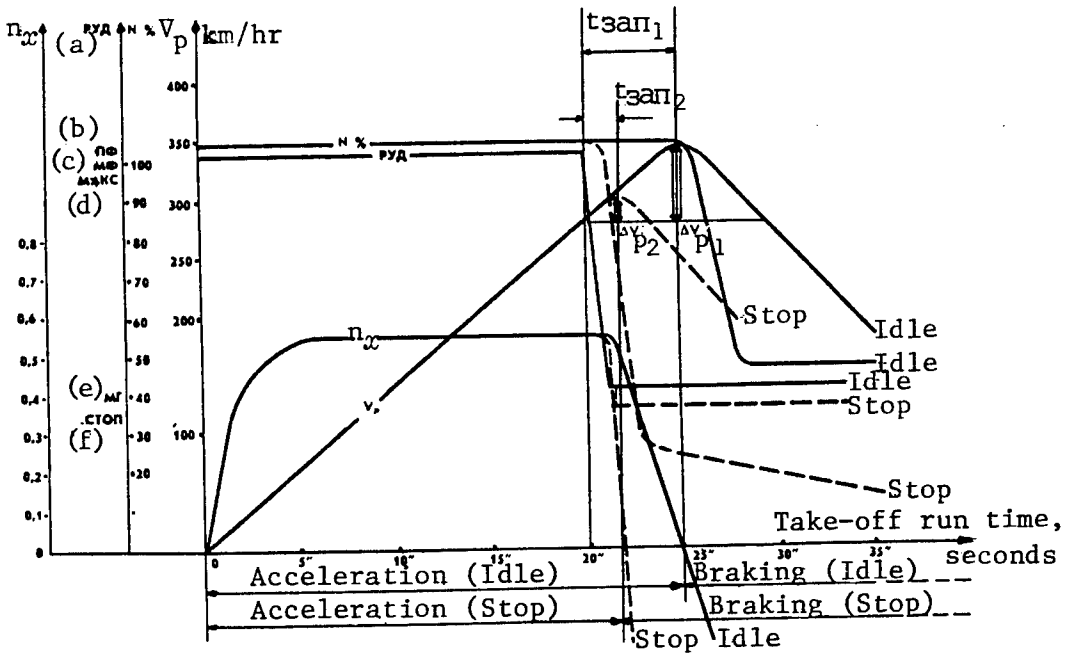
$$t_{зап_I}$$

up to 5 sec. When the engine control throttle is shifted from "Maximum" to "Idle" setting the

$$t_{зап_I}$$

is somewhat less (up to 2-3 sec). This phenomenon is connected with operating features of the power plant's automatic fuel-metering equipment. In the final account, from the moment the engine control throttle is retracted to "Idle" until the aircraft begins to slow (n_x is less than 0), there will be an increase in speed of the take-off run ΔV_p by the amount

$$\Delta V_{p_I} = Q_p \cdot t_{зап_I},$$



Change of acceleration and braking characteristics when aborting aircraft take-off.

Key:
a. Engine control throttle
b. "Low afterburner"
c. "Full afterburner"
d. "Maximum"
e. "Idle"
f. "Stop"

which can reach 100 km/hr (see diagram).

When the engine control throttle is immediately placed on the STOP rest—retraction time of engine control throttle is —

$t_{руд}$

there will be an instantaneous cut-off of fuel, slowing of the aircraft (n_x less than 0) will begin two or three times earlier and will be carried out considerably faster than in the previous case. The increase in speed also will be reduced two or three times and will not exceed 30 km/hr.

The decision for aborting the aircraft's take-off must be made by the pilot (or flight operations officer) prior to a certain speed called the critical speed of decisionmaking $V_{kp.p}$: this is aircraft speed at the moment take-off is aborted which ensures that the aircraft stops within runway limits without using special airfield arresting devices.

Every pilot must have a firm knowledge of the value of $V_{kp.p}$ for his own aircraft, its take-off weight, engine power setting, and other factors. Based on this he has to act in a strictly specific and consistent manner when aborting take-off. Let us consider two nonstandard instances.

First. If on the take-off run trouble arose in operation of aircraft equipment or uncertainty arose in the pilot as to its serviceable operation with V_p equal to or less than $V_{kp.p}$, the power plant must be shut down by placing the engine control throttle on the STOP rest; after making sure the nose wheel has been lowered into place, begin braking (regardless of speed), holding the direction of the run along the runway's centerline; report to the flight operations officer if possible; at a speed not exceeding the limit for releasing the brake parachute, release it; after the aircraft stops act in accordance with the situation and commands of the flight operations officer.

Second. With V_p greater than $V_{kp.p}$ and in the presence of engine thrust it is necessary to continue take-off, reporting to the flight operations officer if possible about the nature of the aviation equipment malfunction.

The amount of $V_{kp.p}$ depends on the type of aircraft, engine power setting, take-off weight, runway length and other factors such as airfield height above sea level, runway condition, and weather conditions.

Depending on aircraft types, take-off weight and engine power settings, design values of $V_{kp.p}$ are within the limits of 260-320 km/hr when taking off on full afterburner with maximum weight; 270-330 km/hr when

taking off on full afterburner and the aircraft is without suspensions; 250-310 km/hr when taking off on "Maximum" and the aircraft is without suspensions.

A decrease in critical speed of decisionmaking with a reduction in the aircraft's thrust-to-weight ratio is explained by the increase in length of the take-off run and consequently by the shortening of available runway length for braking on the run when aborting a take-off.

If it is impossible to take off because of complete or partial loss of engine thrust, then it is necessary to make a decision for ejection if there is a reserve of speed as specified by the pilot's instructions on the specific aircraft. In case of increased threat of flight safety (fire, trouble in operation of the hydraulic system and so on), the pilot should eject immediately after the aircraft lifts off and leaves the runway.

Prompt decisionmaking for aborting or continuing a take-off and precise, correct actions both by the pilot and by the flight operations officer will help make the take-off of modern jet aircraft completely safe.

6904

Next Steps After INF Treaty Discussed

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[Unattributed article:"A Step Toward Security"]

[Text] The Great October's banner has been fluttering proudly over our country for over 70 years. Beginning with its first legislative decree, the Decree on Peace, the Land of Soviets has been persistently struggling all these years to rid mankind of wars and to have peaceful coexistence. In resolving international security problems it combines in its foreign policy a firmness of principles and positions with tactical flexibility and a readiness for mutually acceptable compromises. The Soviet Union has advanced over one hundred specific proposals aimed at curbing the arms race and at nuclear disarmament just since World War II.

The program for creating an all-encompassing system of international security advanced by the 27th CPSU Congress became a very major accomplishment of Soviet foreign policy of recent times. The party proceeds here from the assumption that genuine security for each and everyone depends not on a further arms race, but on common efforts for the sake of creating a safe, nonviolent world.

The USSR believes that peace not only is possible, but also must exist without nuclear weapons. The Soviet program for total elimination of nuclear arms before the end of the century is aimed at this. It already has become reality.

Vivid proof of this is the Soviet-American meeting in Washington in December of last year. This was a major event in world politics. One can even speak of a move to a new and very important stage, both from the standpoint of bilateral Soviet-American relations and from a worldwide standpoint. The treaty's significance goes far beyond the framework of its specific content. It gives peoples a chance to get onto the road leading away from catastrophe.

Most important, the treaty that was signed marked the beginning of real elimination and destruction of nuclear weapons. This elimination is beginning with intermediate and lesser range missiles. It is common knowledge that they comprise a direct and serious threat to the territory of the USSR and its allies.

The INF Treaty is the first agreement between the USSR and United States on the destruction of nuclear weapons. It confirms the force of new political thinking and is evidence that the Soviet Union is achieving adoption of such thinking in the practice of international relations.

This treaty meets the expectations of all peoples and has an international character. The interests of the USSR's Warsaw Pact allies and U.S. allies in the NATO bloc as well as the interests of all world countries, the security of which now increases, are interconnected in the treaty.

The treaty's signing was the overcoming of a unique psychological barrier which existed for a long while in relations between the USSR and United States. An opportunity arises to begin more cardinal decisions on eliminating nuclear weapons, particularly on a radical reduction in strategic offensive arms.

With the move to new milestones, other pressing problems have become acute and demanded increased attention to themselves: a reduction of troops and conventional arms in Europe, elimination of chemical weapons, and cessation of nuclear testing.

But as forward progress is made the question of asymmetry and disbalance in various classes of arms and branches of armed forces arises more acutely. Some in Washington, for example, repeat over and over that the INF Treaty gives the Soviet Union advantages since American missiles capable of hitting USSR territory are being destroyed while Soviet intermediate and lesser range missiles do not reach the United States. At the same time some Soviet citizens ask why more of our missiles are being eliminated than American missiles.

Yes, the USSR has to destroy overall around 1,750 missiles of both classes and the United States has to destroy over 850 (this includes those deployed and not deployed). Comrade M. S. Gorbachev said on this account that Moscow took that step with the wish of moving the cause of nuclear disarmament off dead-center. In this case the algebra of politics outweighs the arithmetic of weapons, and without detriment to the security of the Soviet Union and its allies. And so our country's adherence to the new political thinking was clearly demonstrated. This step is being assessed on its merits by all progressive mankind. It can be said that common sense won out.

But the breaking of old views is accompanied by resistance from those who link their political and material well-being with such views. Some in the West are inclined to interpret the flexibility and initiative of Soviet foreign politics as readiness for unilateral concessions. The leaders of our party and state have stated more than once on this score that the Soviet Union will not agree to lesser security for itself.

Literally from the very first days after signing of the treaty, voices began to be heard in certain circles of the United States and some other western countries calling on the leaders of the United States of America not to go too far in the disarmament process. The Joint Chiefs of Staff assigned the U.S. Strategic Air Command to determine what nuclear weapons could fill the "gap" in the West European defense after elimination of intermediate range missiles. It is proposed to assign this mission to B-52 bombers with cruise missiles or to FB-111 bombers and F-16 fighter-bombers. It is planned to transfer new American strategic missile submarines to the NATO zone. And finally, calls are sounding in Washington to accelerate the SDI program.

These are dangerous trends and we cannot underestimate them. They can undermine the change seen in the process of demilitarizing international relations as a whole, and particularly in Europe.

At the meeting of heads of Warsaw Pact member states in December of last year there was a statement of Warsaw Pact countries' resolve to continue to make their contribution to the cause of strengthening peace and disarmament, creating an all-encompassing system of international security, and solving other complex global and regional problems. To this end they will strive for a close interworking with all forces acting to preserve and strengthen the peace and to exclude war from the life of mankind forever.

The general Soviet foreign policy line remains unchanged—to follow Leninist principles in the campaign for peace and security. Therefore the INF Treaty fully meets the course which has been set. This is an enormous political victory by our party.

But the world situation remains complex and tense through the fault of militant imperialist circles who wish to break the military-strategic parity and achieve military supremacy over the USSR no matter what. The Communist Party and Soviet government are doing everything necessary to ensure the security of the Soviet Union and that of our friends and allies.

CPSU Central Committee Politburo Candidate Member, USSR Minister of Defense Army Gen D. T. Yazov emphasizes that this is why we must continue to raise vigilance and combat readiness, strengthen discipline, elevate the troops' political-moral state to a new level, and show constant concern for the Armed Forces' technical outfitting. The party is firmly counting on military cadres to accomplish missions of strengthening national defense. Soviet citizens must have an unshakable conviction about our military might.

6904

Nap-of-the-Earth Flight Training for Helicopter Pilots

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No 3, Mar 88 (signed to press 1 Feb 88) pp 16-17

[Article by N. Frolov, doctor of medical sciences; Maj Med Serv V. Kozlov, candidate of medical sciences; and Maj Med Serv A. Chuntul: "Near the Earth's Surface"]

[Text] First Class Military Pilot Capt V. Surov was assigned a mission of delivering a strike against a conditional enemy strongpoint. The crew had to proceed to the target at extremely low altitude, taking into account the disposition of air defense weapons.

The rotary-wing craft was on the run-in heading at the designated time. The strike against the targets turned out to be sniperlike. It seemed the mission had been successfully executed, but when the helicopter landed, information came from the range that it had been hit by a surface-to-air missile system.

It turned out that Capt Surov was unable to completely maintain the established flight regime and had increased altitude on approaching the target.

Such facts are not encountered that rarely in aviators' combat training. What is the problem here?

Helicopter flights at a height below 15 m represent a rather difficult mission for the crew. The proximity of the earth's surface, the large number of obstacles (objects higher than flight altitude) along the course, and as a consequence the high likelihood of a sudden complication of the situation along the route are the principal

factors determining the psychophysiological features of the pilot's activity. They have to be taken into account without fail in preparing for flights at extremely low altitude.

In flying close to the earth's surface a pilot is forced to pay primary attention to safe handling of the helicopter. Studies show that he devotes up to 84.5 percent of the time observing the situation outside the cockpit, with 62 percent of that time spent observing straight ahead along the heading. In so doing he accomplishes two principal tasks: he makes an eye estimate of the altitude and precision of maintaining it, and he monitors the situation along the heading in order to promptly detect and go around an obstacle.

The dual purpose of visual fixations directed straight ahead outside the cockpit also dictates different points of their application. To assess flight altitude the pilot directs his gaze at a zone located not far from the helicopter in which even slight altitude deviations are more clearly visible. To analyze the situation along the heading, however, he fixes his gaze considerably farther away. In so doing he views rather large areas of the earth's surface and air space in order to have time to forecast conditions along the route.

And so the optimum combination of two objectives of visual fixations directed straight ahead outside the cockpit is extremely important for ensuring flight safety. The pilot may not take prompt note of obstacles along the heading if he gets carried away with monitoring altitude and, conversely, he can make a dangerous descent if he devotes much attention to observing the situation along the route.

A pilot experiences the greatest difficulties in accomplishing the combined tasks when flying over terrain with a large number of obstacles (trees, elevations, power lines and so on). Commanders responsible for crews' initial training should constantly remember this.

The experience of aviators' combat training indicates that the safety of flights near the earth's surface depends above all largely on the accuracy of eye measurements of altitude. Such an altitude estimate is made according to angular dimensions of visible objects on the ground and their angular velocity of displacement. The larger the angular dimensions of objects and the higher their rate of movement, the less the altitude and vice versa.

We will note that external conditions also substantially influence accuracy of maintaining altitude when flying near the earth's surface. Flight speed, nature of the underlying surface (forest, fields, smooth water surface, snow cover, mountains and so on), conditions of illumination, the Sun's position relative to the flight heading, and visibility (transparency of the atmosphere and cockpit canopy glass) should be included among them above all. It has been established that accuracy of maintaining flight altitude below 15 m increases with an increase in speed from 80 to 240 km/hr. Greatest accuracy is reached at a speed of 160-240 km/hr.

The objectivity of an estimate of flight altitude drops when flying over the water's surface or snow cover. This is explained by the fact that under such conditions there are no reference points to which the eye is accustomed and from which the pilot can determine altitude. Therefore, it is advisable to refer to the radio altimeter more often when flying over terrain devoid of reference points.

Maintaining altitude also is hampered when flying over a forest. Studies have shown that pilots maintain a given altitude, 5 m for example, with an excess of up to 10 or more meters. This apparently is explained by the fact that when flying over a wooded area there is an increased likelihood of trees appearing along the heading which are considerably higher than the others and are not always noticeable from afar. Remember one other feature when flying over a forest as well as a desert: the forest and desert are capable of concealing elevations, power lines and high-voltage support structures, which merge with the surrounding background.

Heightened attention in determining flight altitude is required of a pilot with a change in the underlying surface, such as when the flight initially is made over the woods and then above low bushes. It has been determined that pilots accustomed to flying over trees or cliffs may suddenly fly too low above low trees, bushes or boulders. This is especially dangerous when executing maneuvers, when the distance to the ground decreases sharply because the main rotor blades and not the fuselage become the lowest part of the helicopter.

Illumination and the Sun's position greatly influence the accuracy of an eye estimate of flight altitude. With a small Sun angle, low trees produce long shadows which create the illusion of flying above tall trees and consequently at a great altitude.

Transparency of the atmosphere gives rise to a feeling of the nearness of objects. Fog, haze, snow and rain create a false impression of increased distance. A decrease in transparency of the cockpit canopy glass also is possible when flying at an altitude below 15 m. Suffice it to say that if large numbers of insects stick to the canopy glass its transparency is reduced by 10-20 percent. Here the acuteness of a pilot's vision outside the cockpit drops to 0.5-0.4.

In examining factors which reduce the accuracy of maintaining flight altitude by eye, we cannot help but take note of one other factor.

A certain conformity to principle has been established in the behavior of a pilot who is mastering extremely low altitude flying. Initially he flies above the desired altitude and then he drops to the desired altitude as skills take shape, but later he gets the feeling that he is flying

either higher or slower when peripheral vision becomes accustomed to angular displacements of ground objects. This leads to a situation where the pilot descends without being aware of it. Consequently it is necessary to monitor altitude regularly on the radio altimeter while estimating it primarily by eye.

Practice in eye estimation of flight altitude is an important element of professional training. The basis for forming habits in eye estimation of altitude can be laid down under ground conditions. For this it is sufficient to climb a hill (preferably rising from 1 to 10 m every meter) and memorize the angular dimensions of various objects and vegetation (small stones, grass, bushes). When a pilot trains in flight, after establishing the desired altitude he must estimate angular dimensions and rate of displacement of objects on the ground. A relationship forms between instrument data and noninstrumental visual signals based on this combined monitoring of altitude which subsequently helps determine altitude only from reference points outside the cockpit.

As already noted, in addition to determining altitude by eye when flying near the earth's surface, a pilot has to detect obstacles promptly along the heading and go around them. The choice and safety of such a maneuver largely depend on accuracy in determining the position of the top of the obstacle relative to the flight altitude. Two procedures can be used for this purpose.

First: the pilot estimates the position of the top of the obstacle relative to the natural horizon line. If the top is above this line the helicopter is flying below the top of the obstacle and vice versa. Second: on approaching the obstacle the pilot observes the dynamics of the position of its top. Three variants are possible here: the top "disappears" beneath the helicopter, meaning the obstacle is below flight altitude; the top "rushes toward" the helicopter, meaning the obstacle is above flight altitude; the top "moves" at the helicopter's level, meaning the height of the obstacle corresponds to flight altitude. The pilot executes an appropriate maneuver depending on the position of the top.

In flying around an obstacle it is no less important to correctly determine the distance from which the maneuver must be executed. To this end, along with an eye estimate of the current distance to the obstacle it is necessary to consider how much the obstacle is above the flight altitude, the speed, and helicopter characteristics. As they gain experience pilots begin to fly around the same obstacles from a closer distance and more vigorously.

The difficulty of piloting at altitudes below 15 m also is determined by the fact that under these conditions a pilot's capabilities for monitoring instrument readings are sharply limited. He can devote only 15.5 percent of the time to perceiving instrumental data. The duration of individual fixations in the cockpit, however, does not exceed 1.6 sec. These figures indicate that an important component of aviators' training for flights near the earth's surface is the development of skills in reading instrument data by short fixations and in piloting the helicopter according to noninstrumental signals. The latter include the position of the natural horizon line, angular dimensions and rate of displacement of ground reference points, engine and blade noise, vibration and so on. Wide use of noninstrumental data in piloting a helicopter near the earth's surface permits the pilot on the one hand to free the visual channel for monitoring the craft's position and on the other hand to ensure earlier detection of changes in the flight regime and in operation of machine units and systems.

The basis for forming skills in piloting based on noninstrumental signals consists of relationships established by the pilot between instrument readings and their corresponding sensations. Aviators who do not have stable skills in piloting a helicopter from noninstrumental signals will unavoidably encounter great difficulties in flying near the earth's surface.

As already noted, in such flights a pilot's attention basically is burdened with flying the helicopter and so his capabilities for accomplishing other tasks (displaying caution, performing navigation orientation and so on) are substantially limited. The effectiveness of crew work and flight safety can be increased by rationally organizing the interaction between the helicopter commander and the pilot-operator (pilot-navigator). Based on features of attention distribution, the navigator is obligated to devote more time to monitoring the situation outside the cockpit to the right and left in the direction of movement, to increase the duration of observing instrument readings, and to be able to inform the commander of any noted deviations with precise, laconic announcements.

A pilot's limited capabilities for performing navigation orientation near the earth's surface require his more thorough ground preparation for accomplishing a given mission prior to flights—thorough study of the route and performance of necessary calculations.

Flights at extremely low altitude place higher demands on the functional state of a pilot's body. The "physiological price" of piloting a helicopter near the earth's surface is rather significant. For example, while a pilot's pulse rate is 82-94 beats per minute at an altitude of 50 m, it reaches 105-120 beats per minute at an altitude below 15 m. This feature has to be considered in regulating the flight regime, especially in the process of initial training, so as not to cause the aviator's premature fatigue and a drop in his working capacity. Studies show that it is advisable to limit flight time near the earth's surface at the beginning of training to 3 minutes with a subsequent rest at a safe altitude for 4 minutes. Flight time near the earth's surface increases as the training program is mastered.

In summing up, we will emphasize that consideration of the psychophysiological features of a pilot's activity in flying a helicopter near the earth's surface substantially improves the effectiveness of his preparation for this kind of flying.

6904

Helicopter Pilot Training for Operations from ASW Cruiser

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[Article by Col Ye. Golosuyev: "Conquering a Height"]

[Text] The ASW cruiser was leaving native shores farther and farther behind. A foamy, cone-shaped wake was being left astern.

Night was falling and dusk was enveloping the cruiser. The helicopters seemed to dissolve in it. They soon had to leave the deck and go off into the sky, but for now two pilots, the leader and the wingman, conversed near one of the craft.

"Don't be in a hurry, follow me," Subunit Commander Major N. Fedorov told Sr Lieutenant V. Brasin.

The palms of the instructor's large, strong hands seemed to denote a pair of helicopters. The pilots once again went over all phases of the upcoming flight and clarified details.

"Now take the machine and prepare for take-off," concluded the major.

Fedorov had a special attitude toward Brasin, who was one of the youngest crew commanders. And it was no small credit to the major that this officer remained aboard ship and had not been reassigned ashore.

Nikolay Ivanovich was Vladimir's first mentor. Acquaintanceship with documents and an interview permitted the conclusion that the lieutenant was diligent and persistent and had firm knowledge. True, he had flown in a different type of machine in school. He was given topics and disciplines which had to be mastered or restudied and a date was set for taking quizzes. The young pilot prepared for them ahead of schedule, and he answered confidently and knowledgeably.

Practice began on the special gear. When Vladimir had acquired firm skills in simulator "flights" he began practices in the helicopter cockpit.

Brasin prepared especially thoroughly for his first sortie. It must be said that he flew rather cleanly. He was authorized to solo after a number of introductory flights. The young pilot's development generally went normally.

It happened that Brasin went on the first long deployment without Fedorov, and Major G. Popov became his mentor. Once they made a hunt for the "enemy" together. The young pilot acted with decisiveness and initiative.

In those days the weather just did not indulge the aviators, and then weather conditions became more complicated. The flight operations officer ordered the crews to return immediately and the machines headed for the calculated point. Then, although his training level was sufficiently high, Vladimir committed gross errors during the descent and landing on the deck.

After this he was temporarily removed from flight duty, while his comrades progressed. The pilot almost lost heart entirely when one of his colleagues tactlessly joked about his failure.

A little later the instructor made several check-introductory flights with Brasin, but the senior commander was in no hurry to authorize him to solo.

After returning from the long deployment Popov and Brasin were invited in for a methods council session. When the major was given the floor he said:

"I made many flights with Brasin. He made errors. He has difficulty remedying them. My attempts to get things moving were in vain. . . . Therefore I have difficulty answering whether or not the senior lieutenant would be able to master himself and be a shipboard pilot."

The methods council decided to return to this question again. That evening Brasin went to see Fedorov at home. Fedorov already knew about everything.

"Nikolay Ivanovich," Vladimir said to him, "I am thinking about transferring ashore. Apparently it is not my destiny to serve aboard ship."

Fedorov was ready for that conversation. He had asked himself more than once what the reason was for the young pilot's failure. And finally he concluded that the mistake lay in the basis of training: much attention had been given to clean flying techniques but little concern had been shown for psychological preparation and a constant increase in difficulty of flying conditions. As a result Brasin had developed mistrust of his own abilities and excessive nervousness.

"Don't be in a hurry, Vladimir," he responded. "I think the matter is correctable."

Fedorov shared his thoughts with the subunit commander, who supported him. They talked over the methodology for Brasin's further training.

And again there was training and practices. On the ground everything went well for Vladimir, but how would it be in the air?

The take-off and box pattern were without criticism, but Brasin tightened up all over as soon as they got on the final approach. It seemed the machine got heavier. It was as if the pilot's tension was transmitted to the helicopter. After coming out beneath the clouds, the deck seemed like a matchbox to him.

"Brasin, don't grip the control that way," uttered Fedorov as calmly as possible (the instructor realized what intonation meant now). "You see, the helicopter is flying stably exactly along the glide path, and everything in general is normal for you."

The major could not say otherwise although in fact not everything turned out as well as he would have liked. He knew that the person had to be supported and his confidence inspired.

"Keep an eye on the altitude... Cut speed!"

Fedorov was just planning to adjust the collective control lever to keep the helicopter from overshooting the circle in which it had to land, but at this time the machine hovered, obeying the pilot's will, then gently lowered to the deck.

"Well now, not bad at all..."

Brasin felt quite confident after approximately two-thirds of the flight program had been covered. The wall of doubt gradually crumbled. The remaining part of the program was devoted to polishing skills. The senior lieutenant worked with unremitting determination in an attempt to make up for lost time.

"The subunit commander is asking whether it isn't time to send you off solo," said Fedorov once. "I think it is time."

Brasin passed the test for flight training with honor. Then he was one of the first to receive authorization for training flights from the ship's deck at night, but he had a restrained attitude toward the unquestionable success. Fedorov was probably more pleased over this. Now he clearly realized that his work had not been in vain and his ward had firmly gotten his wings.

Then came the next flight. Brasin took his place in the cockpit. He was composed and his actions were precise. The special fascination of the sensation of an imminent meeting with the fifth ocean is concealed in the dry clicking of toggle switches, the singing of actuated gyroscopes, and the mutual reports.

" 'Twenty,' take off!"

Brasin increased the engines' rpm. Navigator Lieutenant N. Osipov counted off the seconds which passed after the leader's take-off in an even voice. The pilot gazed fixedly at the greenish deck resembling a soccer field and at its chain of clearance lights. "Don't hurry!" he recalled Fedorov's caution. "Yes sir, don't hurry!" he responded mentally and lifted the helicopter upward with a skilled, confident movement.

The desired altitude was reached and the helicopter was placed in level flight.

"Arrived in area, have begun work!" Fedorov soon reported to the ship.

The night hunt for an underwater "enemy" is a complicated mission. It demands special attention and teamwork. The more close-knit and cohesive the crew, the greater the chances for victory. The feeling of fellowship and capability of understanding each other with hardly a word spoken do not come at once, but as a result of lengthy practices and simply of human contact. Only then is stable feedback adjusted between commanders and subordinates. It existed long ago between Brasin and Osipov.

The minutes of the flight stretched out tediously. Then the navigator quickly glanced at the commander and uttered:

"Buoy number ... triggered."

Brasin immediately reported this to the leader. True, the signal was somehow strange. Perhaps false? But even a false signal could not be ignored. Several minutes later the guess was confirmed and the hunt continued.

Another lap had been made. A green light blazed up on the instrument panel: the "enemy" had been detected. Osipov checked once more whether or not there were surface combatants in the vicinity. The sea surface was clean. Then he touched the tuning knob and a strong noise hit his ears. The navigator winced in surprise. He had never before had occasion to work with a submarine proceeding at such high speed. Usually she gave away her presence only by a "whisper." There is no confusing her "voice" with that of surface combatants: it is more ringing and metallic for the latter. This was something quite different... Brasin immediately reported to the leader that the target had been detected and the leader reported to the cruiser. Mission accomplished.

Soon the pair received an order to return. Now others would begin tracking the submarine.

And so one more height had been conquered and another step taken toward the peak of professional maturity. This path is difficult and conceals both surprises and obstacles. A person who is strong in spirit, who believes in

himself and comrades, and who has sensed the feeling of fellowship conquers it. There is confidence that Brasin and his colleagues—shipboard pilots, people with a high sense of duty—are successfully conquering it.

6904

Diagnosis, Treatment of Prostatitis Among Air Forces Personnel

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[Article by Lt Col Med Serv A. Guskov, candidate of medical sciences: "Forbidden Subject"; first five paragraphs are letter from pilot Maj A. R.]

[Text] "During service I became supercooled on more than one occasion. Once I felt a pain below my abdomen after such an incident. I went to the physician and analyses were made. They were normal and I was told I was healthy.

"Approximately a half-year later the pains reappeared, but this time with a temperature. At the same time I also felt sexual disorders. The reason for my feeling poorly could not be determined from a hospital examination and my complaints were categorized as mental deviations. The physicians advised me to try to get out of this state, otherwise I would have to be treated by a psychiatrist.

"After routine leave I was sent to the Central Military Aviation Scientific Research Hospital for an examination. After a chat and an examination in the clinicodiagnostic laboratory the physicians said that I had a chronic disease of the prostate. With this sad experience I concealed my malaise, hoping to pass the VLK [aviation medical board] and, after beginning official duties, to find a physician in a pay polyclinic who could help me. I rejected the treatment suggested in the TsNIAG [Central Military Aviation Scientific Research Hospital].

"Laboratory physicians invited me in for a discussion several times more and explained that the examination being performed did not reflect on my official duty. Finally they convinced me and I told them that I already had been ill for a long time.

"I felt better at the very beginning of treatment. I am convinced that my service would have turned out differently had the attitude toward me been just as attentive earlier. I am sincerely grateful to associates of the clinicodiagnostic laboratory whose professional and civic qualities permitted identifying my true ailment and taking steps for treatment and preserving my health despite all my stubbornness..."

(From a letter from pilot Maj A. R.*)

At first glance this is the usual letter from a grateful patient who found his physician, i.e., a specialist who helped him cope with an ailment. This is not quite so, however, and here is why. First of all, the letter was written by a pilot. It is common knowledge that people in flying professions ordinarily dislike not only writing about their illnesses, but even talking about them. Secondly, the letter tells about a disease in the category of those which people try not to talk about. Perhaps it is a question of a disease rarely encountered in the practice of flight medicine and not meriting careful attention? This too is not so.

But it is time to lift the curtain of mystery and present dry statistics describing the true state of affairs. According to scientific research data of foreign and Soviet scientists, a considerable number of young men of reproductive age (20-40 years old) who are considered healthy in fact have changes in the prostate caused by its disease. Persons in flying professions are no exception.

For those not familiar with this organ I will say frankly that it plays a very important role—sexual—in the body's basic functions. Therefore in addition to the usual sufferings, prostatitis also can deliver sufferings which by virtue of their specific nature go far beyond the bounds of an ordinary illness and often lead to disorder of the nervous system function. In this respect the picture of Pilot R.'s disease illustrates that assertion.

Initially it seems that the timeliness of this subject for flight medicine is obvious and generates no doubt, but that is only what it seems. In fact a conspiracy of silence has formed around this vitally important topic and it ended up unofficially in the category of so-called "forbidden" subjects. There are many reasons for this and in a short article one would hardly succeed in revealing all aspects of the problem, and so I will dwell on the important ones.

In my view the first reason is dictated by serious omissions in the system of sex education, which largely has an amateurish, sanctimonious nature. To this day this system experiences the consequences of religious-church interpretations and prejudices. For example, I became convinced of people's poor state of information in questions of special physiology during many years of contact with aviators. Ignorance and dilettantism always are fertile soil for idle impressions and preposterous fabrications.

The second and no less important reason is the deep-rooted and completely incorrect idea that prostatitis has only a venereal origin. In other words, it allegedly is a consequence of sexual dissoluteness; hence the natural desire of ill people to conceal their condition and avoid an incorrect assessment by the command element and colleagues.

Chronic inflammatory diseases of the prostate take two forms—infectious and noninfectious. According to published data of our own and foreign scientists the so-called "true" chronic prostatitis, which is the result of an infection (by the way, not at all necessarily of venereal origin), is encountered only in 30 percent of the cases. In the other 70 percent it is a question of neurovegetative prostatopathy, having nothing to do with infectious diseases let alone venereal diseases.

This disease earlier was called congestion prostatitis. Its basis is neurotrophical disturbances in the prostate arising as a result of psychoemotional overloads, fatigue, supercooling, disturbance in the rhythm of sexual life, and intoxication such as by nicotine or alcohol.

Experience shows that a number of factors contributing to the development of neurovegetative prostatopathy are easily remedied by existing efforts and means, above all by improving work and living conditions.

This problem also has purely medical aspects. Above all, strange as it may seem, it is the insufficient state of information of some physicians, including urologists, about the prevalence of those diseases and about features of the clinical course, diagnosis and treatment of each of them. The following often occurs in practice. If the urologist does not find signs of active inflammation (the presence of an increased leucocyte content) in the analysis of prostate secretions, he considers the patient healthy and naturally not requiring treatment. With regard to complaints of sexual disorders, on this score he recommends referring to a neuropathologist, psychiatrist or sexual pathologist, but they too often do not find "their own" pathology. As a result the patient begins to go in circles and in the end really acquires traits of a neurotic or mentally ill person: he becomes quick-tempered, irritable, and intolerable in the collective and family, and his sleep, memory, attention and working ability deteriorate.

As already stated, however, so-called neurovegetative prostatopathy, which has a similar clinical picture in the absence of an infectious agent and with essentially normal analyses of prostate secretion, very often is concealed under the mask of chronic prostatitis. Therefore the absence of changes in the analyses still does not mean that the person is healthy.

In addition, until lately medicine did not have sufficiently effective methods for treating neurovegetative prostatopathy, especially when complicated by sexual disturbances. Therefore the physicians' actions are justified to a certain extent. For example, what good is it if an accurate diagnosis is made, for it still is impossible to suggest an effective treatment for the patient? Moreover, the male psyche is a very easily wounded instrument. In connection with this, even with the discovery of changes in the prostate characteristic of neurovegetative prostatopathy, the patient often is not given any information so as not to focus his attention on it.

Over a long period of time, while working as a urologist in a flight medicine establishment, I came to know this "cuisine" well. It seemed there was no solution, but in having constant contact with patients it is impossible to avoid solving pressing problems. Thus in studying another very important problem of restoring kidney function by methods of electrical and sound stimulation, I arrived at an unexpected conclusion, based on which a new method of treatment was created [sozdat].

Results obtained in its clinical application showed that the method substantially changes the picture of treating patients of this profile, especially those with neurovegetative prostatopathy: stable clinical recovery with restoration of sexual function is observed in 86-90 percent of the cases.

More than 400 persons have been treated by this method over the last seven years. The methodology of treatment has been developed and approved in the country's leading medical centers including in the chair of urology of the Military Medical Academy imeni S. M. Kirov, and has been authorized by the USSR Ministry of Health for broad clinical application. The apparatus created [sozdat] for treatment is based on the principle of electric stimulation of the prostate by a pulsed current. The apparatus is simple and reliable to operate. It is produced in series for public health needs under the name "INTRATON-1." It was exhibited at the USSR VDNKh [Exhibition of Achievements of the National Economy] and was awarded a silver medal. Materials on observations have been published in central scientific journals and digests.

It is important to repeat that chronic inflammatory diseases of the prostate have a pronounced negative effect on the central nervous system function and on a person's neuropsychic activity. Therefore the interests of health and flying longevity dictate the need for a full study of the question of the prevalence of such diseases among persons in flying professions and development [razrabotka] of an orderly system of their identification, diagnosis, treatment and prevention.

This problem bears not only a clear-cut social character, but also is directly related to flight safety. The sophisticated aviation equipment and conditions of its tactical employment demand extreme intensity and concentration of physical and mental forces from all categories of aviation specialists. Special demands are placed here on the neuropsychic and emotional spheres and their attributes such as memory, attention, working ability, behavior in the collective and so on, which largely are determined by existing family and service relationships. The balanced nature of these relationships is one of the guarantees of precise, cohesive functioning of all elements of the complex system called "man-machine."

Footnotes

*The officer's name is not given for understandable reasons.

6904

Attack Aircraft Bombing Strike

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[Photo article by S. Skrynnikov, AVIATSIYA I KOSMONAVTIKA special correspondent: "Against Ground and Airborne Targets"]

[Text] Strenuous classes in classrooms and on simulators, the search for best solutions in the course of independent training, and the heated arguments about effective methods of the formidable aircraft's tactical employment are behind them. Today the aviators have the most important job, flying. In the boundless sky they will take a difficult test for professional expertise and tactical maturity.

They have to locate and engage a small target in the "enemy" rear. According to intelligence they should expect strong opposition by his fighters and ground air defense weapons. Therefore, the crews delivering the bombing strike and the escort fighter pilots carefully analyze the tactical situation taking shape. Ground specialists also are faced with a responsible mission. In a short time they have to prepare aircraft for the sorties in a quality manner and ensure faultless functioning of combat equipment and weapons.

The route has been plotted and the procedure for interworking between crews and command posts has been clarified once more. Take-off! First Class Military Pilot Lieutenant Colonel N. Gerasimenko, who has been awarded the Combat Merit medal; first class military pilots and internationalist aviators Major Ye. Yasinskiy, wearer of the Order of Red Star, and Captain F. Ibragimov, wearer of the Order for Service to the Motherland in the USSR Armed Forces, 3d Class; and others take off, gain altitude, and confidently get on the given heading. The escort fighters piloted by officers S. Oskanov, A. Tolubayev, M. Chumak, N. Volayev and A. Korotchenko soar into the sky as well.

Each one is credited with many victories in the air and several types of aircraft mastered. First Class Military Pilot Col S. Oskanov, for example, was one of the first to master the new equipment and has been awarded the orders of Red Star and For Service to the Motherland in the USSR Armed Forces, 3d Class. The Order for Service to the Motherland in the USSR Armed Forces, 3d Class was bestowed on Military Pilot-Sniper Lieutenant Colonel A. Tolubayev. During service as part of the limited contingent of Soviet troops in Afghanistan, Major A. Korotchenko, wearer of the Order of Red Star, repeatedly had occasion to display all his proficiency in overcoming dushman air defense weapons. The officer has abundant combat experience.

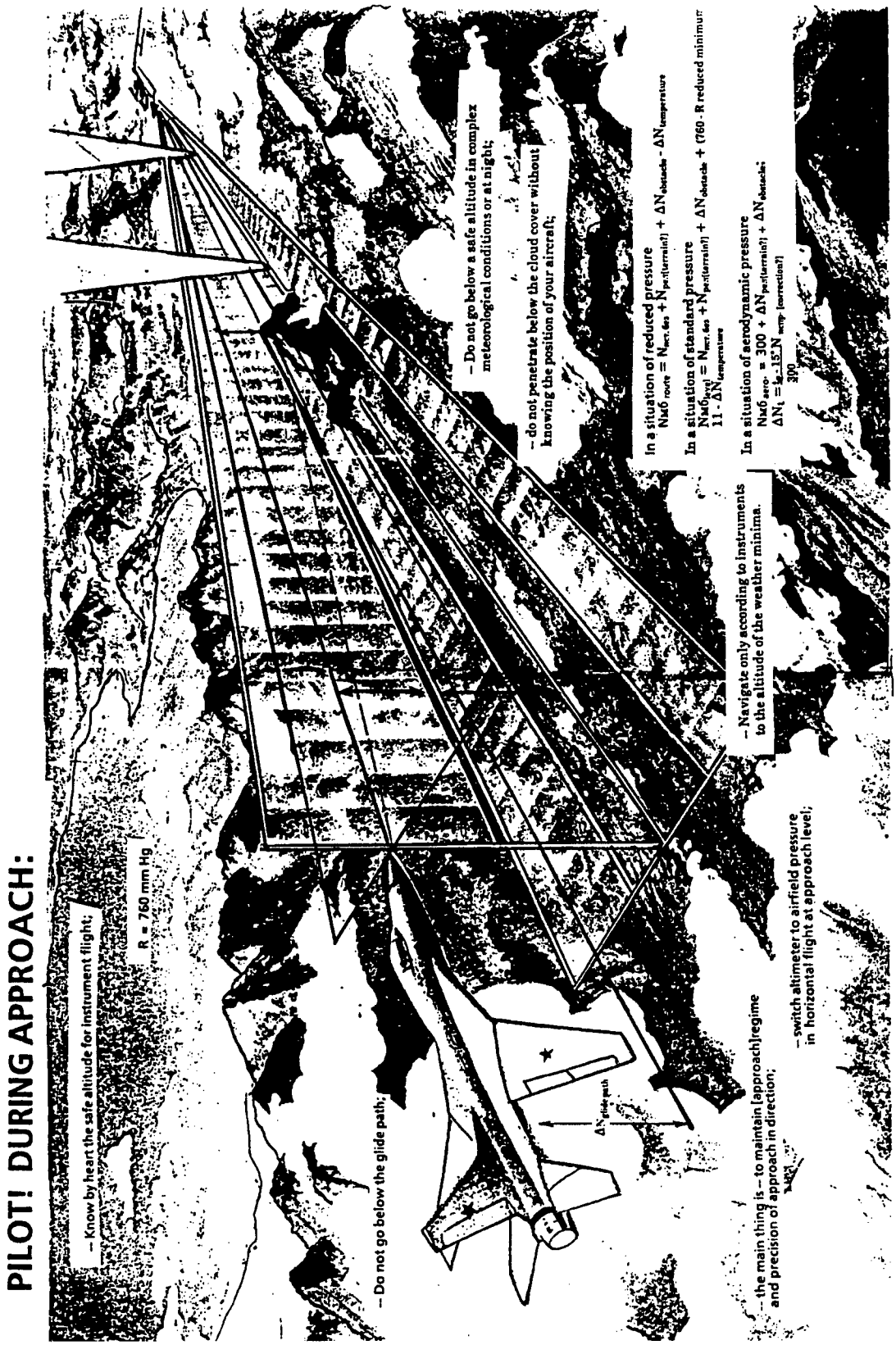
The "front line" has been crossed. Changing altitude and heading, the aircraft approached the target from a direction unexpected by the "enemy." Now the important factor is to deliver an accurate strike with the first pass. The "enemy" is experienced; he will recover quickly from the surprise and will not allow a second strike to be delivered. Each aviator knows his maneuver. Some impose combat on the "enemy" fighters which arrive and others neutralize air defense weapons. Major Ye. Yasinskiy and Captain F. Ibragimov, masters of bombing and strafing strikes, are on the bombing run. They hit all targets accurately. The combat test was passed with honor.

Pilot! During Approach:

91440069r Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 88 (Signed to press 1 Feb 88) pp 24-25

[Unattributed diagram entitled: "Pilot! During Approach:"]

[Text]



UD/335 6904

Squadron Operations, Party-Political Work in Afghanistan Described

91440069l Moscow AVIATSIYA I KOSMONAVTIKA in Russian
No 3, Mar 88 (signed to press 1 Feb 88) pp 28-29

[Article by Maj Anatoliy Stepanyuk: "Under Combat Conditions"; first paragraph is AVIATSIYA I KOSMONAVTIKA introduction]

[Text] Deputy Squadron Commander for Political Affairs Major Anatoliy Stepanyuk is a first class military pilot. He has served in the limited contingent of Soviet troops in the DRA since August 1986. He proved to be a bold combat pilot and an excellent gunner and bombardier in performing combat missions. Active, purposeful party-political work aimed at ensuring high quality and effectiveness of the training and upbringing process and of combat activities is carried on in the squadron under the direction of the commander and political deputy.

When I encountered genuine combat reality for the first time on arriving in Afghanistan in 1986, many difficult problems arose for me as squadron political officer. Senior comrades advised how to arrange party-political work here, where to give special attention, and what forms and means to use in order to influence people's hearts and minds more effectively.

I adopted much good advice. Sensing the support of Squadron Commander Lieutenant Colonel A. Bashtan and relying on the help of party organization secretary Capt A. Savkov, Komsomol organization secretary Sr Lieutenant I. Ushatskiy and party activists, I was able to adjust party-political work in the squadron based on requirements of the combat situation. This unquestionably had a positive effect on accomplishment of the missions facing our collective.

I remember the exciting August days when we were placing pilots who had arrived in the DRA in formation. We held a party meeting, a Komsomol meeting and talks according to the servicemen's categories, and we organized an exchange of experience. Thus the pilots whom we arrived to replace shared observations about the nature of the fighters' operation under combat conditions; advised how to act in a particular situation, how to orient ourselves, how to locate targets, how to deliver strikes and how to avoid the fire of dushman antiaircraft weapons; and told how the mountains look in the morning, during the day, in the evening, and in overcast or clear weather.

Matters naturally were not limited to this. Our predecessors later showed in practical work what they had been talking about. In particular, when a mission was assigned to deliver a strike against a rebel weapon and ammunition depot at the request of Afghan Army representatives, the previous commander and political officer went on the mission and took along as wingmen the new commander and political officer respectively.

The depot was located in the Panjshir Gorge in an area difficult to get to. The fighters formed a circle above the target at a safe altitude. The leaders helped novices compare the map with the terrain and correctly determine where the depot was located and what its characteristic signs were, and they gave another reminder about the procedure for delivering the strike. The the first pair made up of the old and new commanders headed into the attack. As soon as they released bombs the second pair struck. The target was destroyed.

A critique was held after returning to the airfield. With consideration of the experience gained, a group of four again went on a mission the next time, but the leaders were the new commander and political officer and the wingmen were pilots with combat experience. Then the experience-transfer chain "dropped" to the level of flight commanders, senior pilots and wingmen. In a short time practically all crews had been prepared for combat actions and subsequently already were working independently. The experience which we gained then served as a reliable basis for subsequent improvement of the pilots' military training.

Party-political work became more active in this period. Party members explained to colleagues the complexity of the situation in the region, emphasized the responsibility placed on Soviet military personnel for giving international assistance to people of the DRA, set the example in practicing necessary procedures, and displayed courage and valor on combat sorties. In emulating them, aviators acted with special enthusiasm on the ground and in the air. High morale helped the pilots become mentally reoriented on a combat basis in a short time.

Of course, the complicated duty conditions also contributed to this. In Afghanistan we saw with our own eyes how complex the military-political situation was and we encountered instances of dushman brutalities toward the civilian population and their provocative attacks on personnel of the limited contingent of Soviet troops. Everyone realizes that he can pay with his life for carelessness, laxity, and lack of discipline. The commander, party members and Komsomol activists were concerned with instilling will, composure, vigilance, and a sense of responsibility for the assigned job in the personnel.

In my view party-political work under combat conditions tolerates no excessive scale or, even worse, approximateness. I saw more than once from my own experience that it has to be conducted specifically and convincingly and have a straightforward, practical direction. Special attention was given specifically to this aspect in the squadron.

I remember that the very first sorties showed which pilots oriented themselves better on the terrain, saw targets better, and bombed or launched missiles and projectiles more accurately. We used all forms and means to popularize their actions and set them as an example for others. Subsequently they above all were the ones whom we began assigning accomplishment of the most difficult and responsible missions. Officers L. Fursa, A. Bashtan, A. Pochitalkin and A. Gavrilyuk often headed up strike groups and coped excellently with missions.

In generalizing and disseminating foremost experience, the squadron commander and party members took special note of what was suggested by the experience of combat work. We ran across the following fact. In giving military assistance to bands of Afghan counterrevolutionaries, the United States and its NATO allies (England above all) lately had begun to supply them especially intensively with the Stinger, Blowpipe and Javelin portable antiaircraft missile systems. Their use naturally forced us to alter tactics.

In conducting party-political work we began to orient flight commanders, group and pair leaders, and all pilots to persistently adopt the experience of actions with the reinforcement of dushman air defense and to seek more effective methods of countering the engagement of fighters with missiles. We devoted more attention to ensuring surprise. Flying under conditions of mountain relief is a rather difficult job; people in the squadron concerned themselves with the quality of preparation for each combat sortie. We studied the map and photographic plotting boards carefully and when we made the target approach there was no longer a need to compare the map with the terrain. It was as if the map was kept in each person's head—that was how well they studied it.

We did not invent some kind of unusual forms and methods in party-political work but tried to make fuller and more effective use of those which had given a good account of themselves under conditions of peacetime combat training, with adjustment for combat missions of course. Party and Komsomol meetings and acceptance into the party and Komsomol were held in breaks between sorties, usually on the airfield at the combat aircraft. We primarily tried to make reports and statements brief but businesslike. We held talks and an exchange of experience on specific occasions when there had been a display of courage and valor of crews in the air. We often put out combat glory leaflets, take-off position leaflets [startoviki], photo newspapers and express leaflets. There was a noticeable decrease in lectures and reports in party-political work plans, chiefly because of the lack of time. On the other hand, there was increasing emphasis on prompt information to personnel about events in our country and abroad, about the military-political situation in the region, about dushman brutalities on Afghan soil, and about crafty intrigues of the imperialists and their accomplices.

Service in the DRA was difficult and required the exertion of moral and physical effort. It was service without days off. Attention, sensitivity to people, and concern for them are especially important here. This became one of the chief directions in party-political work conducted in the squadron. What were the results? There were some. For example, we had no misunderstandings between pilots and technicians. Each was accomplishing very important missions in his own place. The pilots realized that much including even their lives depended on conscientiousness of technicians and mechanics. And the specialists in turn realized what responsibility was being placed on them. This united the people and made them close-knit. This probably was why relationships of strong troop comradeship, profound mutual respect, heartfelt warmth, and trust were established with us. In many months of service in the DRA I do not remember an instance of rudeness, lack of self-control, or uncomradely attitude toward one another.

Many genuine masters of combat employment developed in the squadron, among them Flight Commander Capt A. Andreyev, 1st Class Military Pilot and party member. He gave a good account of himself from the first days of his presence in the DRA. He orients himself confidently on the terrain, locates targets quickly and is able to "lock onto" their characteristic signs. He attacks the target resolutely and hits it with the first attack. We generalized his experience more than once and made it the property of others. And Aleksandr Nikolayevich himself considers it his duty on returning from a flight to tell comrades in arms how he acted in the air and what ensured success.

And how can we not say a good word about Squadron Chief of Staff Major V. Golubev, a party member and 1st Class Military Pilot? Vyacheslav Konstantinovich flew many combat sorties, delivering missile and bombing strikes against the dushman. Each time he displayed courage and valor, but one instance forced us to speak of him with special respect.

The dushman brought his fighter under fire as he delivered a strike near Black Mountain. One bullet struck the turbine blades and the engine stopped. The pilot twice attempted to start it, but failed, and then ejected at the group leader's command. He landed in the mountains, receiving a serious injury when he struck the rocks.

Squadron Commander Lieutenant Colonel A. Bashtan urgently called for a search and rescue support helicopter. All group pilots formed a circle above the place where Golubev landed and remained there, preventing the dushman from approaching him. The pilots brought them under fire and cut off approach routes. Major Golubev himself displayed enviable self-control and courage. He switched on the radio beacon, got out grenades, an automatic weapon and box magazines for it, and prepared for an all-around defense. The helicopter made a precise approach to the operating radio beacon and took Golubev aboard.

Previously recommended for the Order of Red Star, this time the officer was recommended for the Order of Red Banner for courage and bravery. Major Golubev's staunchness, selflessness, valor and self-control displayed in an extreme situation had an inspiring effect on the aviators. This example later was used widely in performing party-political work in the squadron.

First Class Military Pilot Capt A. Savkov, the squadron party organization secretary who later was advanced to the position of flight commander, also gave an outstanding account of himself in the DRA. I will say frankly that this is a remarkable combat pilot and a good secretary. Operating most often in a pair with Capt A. Andreyev, he functions precisely and confidently in the air and always copes with flight assignments. As party secretary he conducts extensive educational work in the collective in light of demands of the April 1985 and January and June 1987 CPSU Central Committee plenums. He is persistent in everything. He invariably takes fulfillment of resolutions of party meetings to fruition. He organizes measures for the job and not for a "check mark" in a plan. Great credit goes to Savkov, for example, for the fact that we regularly hear accounts from party members at party buro sessions or party meetings, which produces rather good results.

The technical personnel also are the equal of the pilots. Sr Lieutenant N. Khudenko, a party member and chief of the flight TECh [technical maintenance unit], has the master's qualification and enjoys indisputable authority in the squadron. The officer constantly keeps a record of the operating hours of aviation equipment and expenditure of service life, and devotes much attention to checking its condition during inspections. It was because of this that Nikolay Mikhaylovich discovered serious defects on two aircraft which could have led to undesirable consequences.

Aircraft technician Sr Lieutenant V. Mekotov, a party member and 1st Class specialist, serves excellently in this flight. He performs his duties conscientiously and the fighter he services is the best in the squadron.

I would also like to take note of Sr Lieutenant A. Buterus, chief of the aviation equipment group. The group he heads already has been outstanding for two years now. In showing concern for an improvement in the mechanics' proficiency, Aleksey Aleksandrovich at the same time tries to keep the fighters' aviation equipment in excellent condition. He also gave a good account of himself as a party activist and non-T/O&E propagandist. Buterus directs the political studies group.

Sr Lieutenant I. Ushatskiy, a 2d Class specialist, electronic equipment group technician and Komsomol member, deserves a good word. He devotes much attention to ensuring faultless operation of equipment and radar sights, realizing that otherwise pilots will be deprived of "eyes" in flight and will not be able to perform the combat mission to the full extent. He also maintains sights in duty-flight aircraft in a serviceable and combat-ready condition. Igor' Petrovich also copes excellently with his duties as secretary of the squadron Komsomol committee.

Our squadron personnel have to accomplish assigned missions under difficult, strenuous conditions. Pilots, technicians and mechanics have a deep understanding of their responsibility; taking advantage of accumulated experience, they try to perform their duty with honor. Specific, purposeful party-political work largely contributes to this.

6904

Results of Restructuring in Aircraft Repair Plants

91440069m Moscow AVIATSIYA I KOSMONAVTIKA in Russian
No 3, Mar 88 (signed to press 1 Feb 88) pp 32-33

[Article by Maj Gen Avn V. Baryshnikov: "Quality is the Chief Reference Point"]

[Text] Management of contemporary aircraft repair production presently is following the path of democratization, expanded participation in it of labor collectives, and active use of advantages of new economic operation methods. The restructuring process is occurring in an atmosphere of broad glasnost and great incentive of workers, specialists and employees in the end results of their labor activity.

Socialist pledges made in honor of the jubilee of the Great October and of the USSR Armed Forces were completely fulfilled. Best results in competition were achieved by collectives headed by V. Mironov, V. Vasilchenko, P. Voronko, V. Kupch, L. Korolek and others. Five Air Force enterprises; 50 shops, sections and brigades; and over 300 leading production personnel were awarded Honor Certificates of the CPSU Central Committee, USSR Council of Ministers, AUCCTU, and Komsomol Central Committee for achieving high production and economic indices as well as good product quality. Active innovators and party members A. Slepykh, a brigade leader of aircraft engine fitter-assemblers, and O. Pulin, a brigade leader of radio repairmen, were awarded the USSR State Prize for 1987 for outstanding labor achievements.

A number of enterprises already have achieved specific success in the process of restructuring in preparing to greet worthily the 19th All-Union Party Conference.

For example, the collective headed by Party Member V. Mironov was among the first to achieve high growth rates in labor productivity and production volume and it is successfully mastering new economic operation methods. Based on results of socialist competition, last year the plant twice was presented the Challenge Red Banner

of the USSR Minister of Defense and the Aviation Workers' Union Central Committee. Success did not come of itself; it was the result of the workers' selfless labor backed up by the specialists' intense creative activity and the boldness and initiative of the enterprise party organization and leaders.

Modern achievements of science, engineering, technology and leading experience are studied promptly here and adopted actively in production. Favorable conditions for this were created by the introduction of new wage rates and salaries as of 1 July of last year. The leading collective is carrying on active preparation for the transition to full cost-accounting. Its experience now is being studied and adopted not only at aircraft repair plants, but also at enterprises of other ministries and departments.

Last year the number of workers employed in dangerous production sectors was cut by more than half thanks to the implementation of the "Health" comprehensive program, introduction of a comprehensive management system, and improvement of labor conditions at enterprises. But this is only the beginning. A very great deal has to be done for further improvement and modernization of work stations, introduction of the brigade contract, and transition to a multishift labor regime.

The successes in the comprehensive resolution of serious technical, economic, organizational and social problems permitted not only ensuring the enterprise's stable financial condition, but also changing its appearance and creating a reliable base for putting out high quality products.

The collective managed by Officer V. Vasilchenko made a great contribution toward raising Air Forces combat readiness. Working under new conditions of economic operation, enterprise workers managed to support a more than 30 percent growth in labor productivity and production volume. Vigorous adoption of the achievements of scientific-technical progress and observance of a strict regime of economy permitted a 3.3 percent drop in the maximum level of expenditures per ruble of commodity production. Targets for fuel-energy resource economy were considerably overfulfilled. As a result they managed to save around 200,000 kilowatt-hours of electrical energy.

The foremost collective is distinguished by a high level of labor and technological discipline. As a result, good quality and high reliability of the aviation equipment placed in operation have been achieved here. Based on results of the 1987 All-Union Socialist Competition, the enterprise was awarded the Challenge Red Banner of the CPSU Central Committee, USSR Council of Ministers, AUCCTU, and Komsomol Central Committee and entered on the All-Union Honor Board at the USSR VDNKh [Exhibition of Achievements of the National Economy].

In comparison with the preceding year, in 1987 there was a 9.8 percent increase in the volume of commodity production at Air Force aircraft repair enterprises and an 11 percent increase in labor productivity. It is also important that the planned index for product quality and deliveries was exceeded. The entire production volume increase resulted from an increase in labor productivity. No small credit for this goes to innovators and inventors. The USSR Exhibition of Achievements of the National Economy silver medal was awarded to A. Shapovalov and bronze medals went to V. Khrenov, V. Dasov, I. Yeliseyev, V. Pitomtsev, S. Grechko, V. Surkov and R. Mazurenko based on results of the NTTM-87 [1987 Scientific and Technical Creativeness of the Youth] Exhibit.

The production development fund is becoming the financial basis for replacing fixed production capital to a greater extent under present-day conditions. Deductions for enterprise retooling and reconstruction also are growing.

The high growth rates of labor productivity in turn created good preconditions for a more than 40 percent increase in the fund of social and cultural measures and housing construction. In accordance with the USSR Law on the State Enterprise (Association), these funds are directed toward further development of the social sphere: creation of better working conditions, further improvement of workers' health and everyday services support, and construction of housing, children's preschool establishments and other facilities.

One of the principal advantages of the new system of economic operation are the stable economic standards and norms. Planning based on such standards becomes an active incentive for growth in the volume of production effectiveness and an improvement in work quality. Therefore, a wage fund increase also now can be obtained only through additional product output or by a reduction in the number of workers.

Work station certification is one of the effective directions in the search for unused reserves. It has been conducted for the first time at Air Forces enterprises, but results are reassuring and are providing a basis for its further improvement. Last year alone work stations which did not correspond to the high demands of scientific organization of labor were eliminated in the certification process.

Nevertheless the chief reserve and principal criterion for evaluating enterprises' readiness to introduce new wage conditions depends on the status of labor norm-setting work. It is not for nothing that this question today attracts great attention of the administration, of party, trade union and Komsomol activists, and of every labor collective. Labor productivity growth rates and the size of earnings and bonuses largely are determined by the objectivity of norms and by their orientation on scientific-technical progress and scientific organization of

labor. This is why labor collectives and all workers and employees take an active part in revising existing standards, bringing them into conformity with the progressive development of production, and organizing labor and management in light of 27th CPSU Congress resolutions.

A strengthening of discipline, efficiency and order in production has been and remains a serious task under the new conditions of economic operation. It is common knowledge that our party Central Committee approved the initiative of foremost brigades and the purposeful work of the Sverdlovsk Oblast party organization in developing the movement for a collective guarantee of labor and social discipline. This initiative found support and development at Air Forces aircraft repair enterprises. Today every fifth brigade has pledged to be responsible for the state of labor and social discipline.

More than 80 percent of the brigades at the enterprise where Party Member V. Bogatyrev is the chief assumed collective responsibility for product quality. At the plant headed by CPSU Member P. Dontsov every third brigade pledged to comply strictly with labor safety practices. Successes are apparent: there have been no instances of production injury at this enterprise for over five years.

The experience of the leading collectives indicates that if everyone takes up the matter actively and persistently, losses of work time from absenteeism and personnel turnover drop by 1.5-2.0 times in a year. These indicators were reduced last year by almost 10 percent for repair enterprises on the whole.

Meanwhile what has been achieved provides no grounds for self-complacency or placidity. Much purposeful work has to be done in this direction because the state of labor and technological discipline at some enterprises does not meet modern requirements and does not correspond to the spirit of restructuring. Omissions in these matters are costing aircraft repair production very dearly. This is not just losses of work time, but also a disturbance of the rhythm of the technological process, instances of production injury and, finally, poor quality of aircraft equipment repair.

More and more attention of party and trade union committees and Komsomol organizations is being focused on strengthening discipline and order at all levels under conditions of increased complexity of aviation systems, intensification of aircraft repair production, and its transition to a multishift work regime. This is manifested in concern for the working person and in activation of the human factor. A comprehensive program aimed at accelerating scientific-technical progress, reconstructing and retooling enterprises, improving conditions of labor safety procedures, and strengthening the health of our workers and specialists was developed and is being actively introduced for this purpose in the current five-year plan.

Work connected with the transition to full cost-accounting and self-financing now is being subordinated to achieving high rates of development of aircraft repair plants. It demands great output and selflessness in the labor of every collective. It is impossible to successfully realize and implement the plans outlined without a constant search for new things and an improvement in the qualification and quality of economic training. In connection with this, fulfillment of the CPSU Central Committee Decree "Restructuring the System of Workers' Political and Economic Training" assumes enormous significance for every worker of the aircraft repair enterprises of the Air Force . The first steps have been taken in this direction. We realize full well that this is only the beginning and that ahead lie new major, responsible affairs connected with the second stage of restructuring and with the accomplishment of new, difficult tasks of returning modern aviation systems to combat formation with high quality.

Shoulder to shoulder with combat aviators, workers of Air Force aircraft repair enterprises are following the confident course of restructuring, full of resolve to strengthen the might of our socialist homeland by selfless labor.

6904

Laveykin's Notes on Soyuz TM-2 Rendezvous with Mir Complex

91440069n Moscow AVIATSIYA I KOSMONAVTIKA in Russian
No 3, Mar 88 (signed to press 1 Feb 88) pp 38-39

[Part One of article by HSU A. Laveykin, USSR Pilot-Cosmonaut: "Mir is Being Built"]

[Text] **At Baykonur**

The weather was freezing on launch day. Hardly had Yuriy Romanenko and I left the bus when we immediately felt the cold, penetrating wind. Here they were, the severe conditions about which we had heard on more than one occasion from comrades in the detachment and specialists at the cosmodrome. I thought: "And how about the launch team, especially there on top on the gantry?" These people have been here for several hours already. Although each one was warmly dressed, nevertheless they had become pretty well frozen in that time. We hurried to the elevator in silent agreement and there decided to take our places in the craft as quickly as possible since we knew that our readiness report would serve as the command permitting these courageous people to leave their work stations.

It is difficult to tell briefly about the feelings one experiences being in a spacecraft. Above all of course there is great gratitude for those who believed in you, entrusted you with the flight and helped prepare for it. It is also

pride in the equipment created by our people, and joy that the very difficult ordeals were over and fulfillment of a dream was near. There was also regret that my father had not lived just another two months until my launch.

My father was a very vivid example in life for me. A military pilot and Hero of the Soviet Union, he told me a great deal about the war and his comrades. Veterans of the Order of Bogdan Khmelnitskiy 5th Guards Fighter Regiment were constantly staying with us. The meetings of friends and their heart-to-heart talks took place before my eyes and unquestionably acted on my child imagination. In thoughts I fought the fascists together with my father. I wanted to become a pilot without fail, but life made other arrangements, and my father had a certain influence on choice of a profession.

After completing the machinebuilding faculty of MVTU [Moscow Higher Technical School] imeni N. Bauman, I began working as a material-strength engineer for manned spacecraft in the KB [design bureau] created by Sergey Pavlovich Korolev. Here I got the desire to test the equipment which I had helped create , especially as engineers of our organization already had blazed the trail to the cosmonaut detachment.

I submitted an application with a request to be accepted in the cosmonaut detachment. After that over a period of several years I was examined by a commission, passed entrance exams, and in 1978 was enrolled in the detachment. Here is where my childhood dream came true.

After taking flight training I began to solo in the Czechoslovak-made L-29 aircraft. Today I am the fifth out of those seven who were selected nine years ago for a space flight.

All these years were filled with strenuous labor. I had to combine studies and preparation for the flight with work in production. Like my comrades in the detachment, I wanted to set off into space as quickly as possible, and there is nothing surprising in this. Young people always have an inherent rush and desire to accelerate events, and I was no exception. Only after some time does it becomes clear that any achievements, especially in cosmonautics, are preceded by daily and hourly labor. This is what opens up the dynamic road into space for the cosmonaut.

A vivid example of that is my commander Yuriy Romanenko. That this is his third flight is no accident, as is the fact that he always was appointed chief operator for extravehicular crew activity in all difficult space walks. His businesslike suggestions, calm voice and always appropriate gentle humor are indisputable components of overall results.

Yuriy has golden hands. Many know that he enjoys swimming with a mask and aqualung and engages in underwater hunting, but far from everyone knows what a superb boat he cut out and glued together himself. The Ufa and Yaroslavl inflatable boat productions might envy his proficiency. And take the vehicle! He himself overhauled the engine and only the fact that we were transferred from being back-ups to the primary crew prevented him from finishing the work.

I. Reznikov, the crew physician, came up in communications with us before the launch. I will remember this person all my life. Our crew is his 30th. He became our mentor and kindly senior comrade who in a difficult moment will suggest how to do something and will always come to your help. Yuriy and I are obligated to him for a great deal, and today on behalf of all crews which he prepared and saw off on flights I would like to thank Ivan Matveyevich for his kindness and cordiality.

Taking advantage of the occasion, I wish to express gratitude to specialists of the Cosmonaut Training Center, the design bureau, and the cosmodrome for the work and concern which they displayed in readying us for the flight.

Soyuz TM and Mir

Launch time approached imperceptibly. The launch vehicle engines ignited.

What sensations did I experience at this time? I was generally ready for them from flight documentation, but the commander predetermined their perception:

"Now the first stage will separate. . . . Expect vibration. It will be a sensation as if you were driving on cobblestone. . . . Now separation..."

Everything happened that way, but in the given instance the reliability of perceiving the sensations seemingly was doubled.

Now the path to Mir largely depended on our Soyuz TM-2 craft. It was being tested for the first time in a manned version.

Further development of our space program with the objective of creating a permanently operating orbital complex required an improvement in the Soyuz T craft, and in its energy capacities and on-board systems above all. The requirement for an increase in the transport craft's power was dictated by the necessity of delivering a crew of three to an orbit on the order of 350-400 km high and not 300 km as was previously the case.

As a material-strength engineer I had a hand in creating the new craft inasmuch as its increased flight altitude was achieved by reducing the craft's so-called dry weight and using a lighter high-strength material for parachute systems and a new emergency recovery propulsion unit.

With respect to on-board systems, during design of the Mir station it was deemed inadvisable to perform a mutual orientation of its docking assembly with the

approaching craft inasmuch as Mir's size and weight would increase as the station was outfitted with modules and consequently the requisite controlling moments would increase, and with them fuel expenditures.

The task was assigned to develop a new control system. This is why the "Kurs" system appeared in place of the "Igla"; the "Kurs" had been officially accepted in the unmanned version of the Soyuz TM craft during its docking with the Mir station. Using data of the "Kurs" system, the craft's on-board computer computes the optimum rendezvous trajectory from the standpoint of fuel consumption with a fly-around of the station, mooring, and docking to the chosen assembly, and implements it with the help of on-board engines.

The systems for the crew's radio conversations with Earth, angular velocity meters, and a propulsion unit with sectional fuel storage were perfected at the same time. Considering previous experience, the craft was designed to be capable of performing necessary orientation of the station, increasing the orbit, and providing power, and its temperature control system was designed to release excess heat forming in the orbital complex.

It is common knowledge that the Mir station is planned for lengthy operation, and so the build-up of equipment in it is to be gradual. The fact is that any article has a service life which has to be used sensibly. This is why the station had only the most necessary gear after being placed in space. The solar batteries are an obvious example. In contrast to Salyut-7, the third panel was installed on Mir almost a year and a half after Mir was placed in orbit.

Together with the ground services, our crew was to begin work of creating a multimodular orbital complex. The first step along this path was the docking of the Mir with the Kvant astrophysics module, which in addition to its purely specific functions also performed the role of cargo-carrier: it had panels for the Mir station's third solar battery. Behind this externally visible construction also was something not visible to the eye but very necessary for the cosmonauts: internal final outfitting of the station with scientific gear, on-board life support systems, instruments, and expendables being delivered by the Progress craft [plural].

It must be said that in addition to the physical final outfitting, a mathematical final outfitting also is possible on the station. I have in mind the computer system which directs the motion control system and on-board instruments: the switch-on, switch-off, and check of all systems. It also includes a crew service computer. This is a unique TsUP [mission control center] aboard the station. This computer permits giving system control commands and it also stores a portion of on-board documentation in memory.

Inasmuch as magnetic storage is used in these computers, by using the command-signal radio link it is possible to change the algorithms without delivering magnetic disks in the cargo craft. In the automatic mode the next software version is sent aboard over the command-signal radio link. The cosmonaut familiarizes himself with it at a convenient time. That is how a qualitatively new final outfitting of the station brain takes place.

Earth Through the Porthole

During the flight aboard the transport craft we performed all operations specified by on-board documentation: monitoring systems, having conversations with the mission control center, and keeping an eye on dynamic operations.

In my free time I observed Earth through the porthole. Its surface is visible from space just as well as from an aircraft, the only difference being that everything is somewhat reduced and its edges are rounded. Space sunsets and sunrises are very beautiful. They resemble paintings by Ayvazovskiy—very many rose, lilac and blue tones. It was obviously not for nothing that the great artist painted his pictures in the evening or at dawn. These are absolutely exceptional colors, and unique each time.

But I was struck most by the view of Moscow. It was cloudless and we were moving over Europe at night. Cities here are located close to each other. Then suddenly against the background of this fiery carpet appeared an enormous star-shaped spot with rays (highways) diverging in different directions. Moscow cannot be confused with a single other city. It is very large and beautiful. The yellow lights of the prospekts—Leninskiy, Vernadskiy, Leningradskiy, and Sadovoye koltso—are quite visible against the background of silvery apartment lights. Further on are the lights of highways leading to Klin, Kalinin, Leningrad, Tula, Kursk and Orel.

I also observed Moscow through binoculars. I could easily see individual houses and once it seemed I also saw my own house in Teplyy Stan, which stands near a beltway. The sensations are very pleasant when you see your native city. Your heart literally warms and you know that now the communication session will begin and voices of people close to you will be heard.

During the flight we became so at home that it was enough to glance through the porthole to say what continent we were flying over: a yellow color meant Africa, where there was a great deal of sand and outcroppings of rock; a bright green color was inherent to America, or more precisely to the northern part of the Amazon. This is an absolutely boundless area of Earth just as our Siberia or the ocean. You cannot take it in with one glance even from orbital altitude. The United States stands out with its canyons. The road network is quite visible; at night it resembles a chessboard. Apparently that is how the towns located along the roads transform it.

The stars are quite visible. There are infinite numbers of them, and because of this the sky seems to be not black, but gray.

Two days later our craft approached the Mir station. Docking was done in an automatic mode. A very vivid impression remained from the approach in the final meters. It was a sensation that you are flying in a very illuminated space and snowflakes are flying by as in a blizzard. These were the attitude engines discharging showers of "snowflakes." Then there was a light thump and the "locks" clamped our craft together with the station.

We had arrived at our destination.

(To be continued)

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Troubleshooting Methodology on Aviation Equipment Discussed

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[Article by Sr Lt V. Mayorov: "The Irony of Chance"]

[Text] This generally curious episode still is perceived in the unit as an unfortunate misunderstanding. "It is a matter of chance," say its participants. "To whom doesn't it happen?" But I would call the incident as an irony of chance. The fact is that what led to it was the indomitable desire of IAS [aviation engineering service] specialists to search for the cause of trouble along the thorny path of disassembly-installation work using the method of going from the complex to the simple and not visa versa.

It happened this way. After a landing the drum of one of the main wheels on the operational training aircraft serviced by Officer A. Muzychuk got very hot. At first it was assumed for some reason that this was due to brake drag because of warped brake disks. The specialists raised the aircraft on hydraulic hoists, removed the wheel and replaced the disks, but a check rolling of the aircraft showed that the defect had not been remedied. Replacement of the brake and installation of new switching mechanisms did not help. What was to be done? It was as if the mind had gone blank, said the aircraft technician and flight TECh [technical maintenance unit] chief later in justification.

The deputy squadron commander for aviation engineering service suggested the correct way to search for the generally elementary trouble. The experienced specialist recommended taking another look at materials dealing with typical brake system malfunctions. After studying them the officers concluded that possibly it was all a matter of the inertial sensor.

They carefully checked it and discovered that it had been incorrectly installed and this had led to the ineffective release of the wheel brake. Normal functioning of the brake system was restored after performance of necessary technical operations.

As we see, they remedied the trouble, but how much time, energy and resources were required for this! The fact is that they had to place the two-seater aircraft on hydraulic hoists, disassemble and install an important assembly, and perform check rollings of the aircraft. All this could have been avoided and the trouble remedied with lesser labor inputs had the aircraft technician and flight technical maintenance unit chief studied appropriate technical information. promptly

It must be said that some aviation engineering service specialists underestimate the significance of technical information. For no reason! It not only expands professional horizons but also, most important, contributes to more effective performance of work on aviation equipment. Such information contains a description of a particular specific trouble, conditions and reasons for its appearance, and methods of remedying it as well as an analysis of typical mistakes made by aviation specialists.

Knowledge of such material unquestionably facilitates the work. For example, having determined the correct troubleshooting methodology (from the simple to the complex), the aviators would have been able to avoid excess unproductive work.

Of course now it is easy to reason and lecture others, some will say, but at the airfield it is considerably more difficult to accurately determine the reason for the appearance of a particular defect on the move. That is all true, but what prompted me to take up the pen was what is in my view a very important circumstance. In the given instance the incorrect actions of aviation engineering service specialists were seemingly programmed. The fact is that we ourselves often set superfluous work for ourselves by following an incorrect methodology: we seek complicated faults where it is necessary to check, for example, a fuze or the voltage supply to various systems and machine units. Then we hasten to follow the difficult path of disassembly-installation operations instead of carefully thinking through everything once more, turning to the technical literature, and consulting with experienced specialists.

The experience of maintaining aviation equipment indicates that the overwhelming majority of defects arising in aviation equipment are rather simple and do not require extensive work to remedy. Let us recall how many times after discovering reasons for what was at first glance a complex trouble we exclaimed, puzzled: "But that is elementary! Where were we looking? Why didn't we suspect that sooner?"

These questions generally are rhetorical, but practically every specialist engaged in maintaining modern aviation

equipment has to answer them in his day-to-day activity. Unfortunately, it is often done by using the trial and error method.

For the sake of objectivity I have to say that the unit has sufficient positive experience in detecting and remedying defects and troubles in aviation equipment. For example, the aircraft and engine periodic technical servicing group headed by Capt V. Bartos gives proper attention to troubleshooting methodology and the study of technical information. For several years now the group has kept a log of power plant operating reliability. Information is recorded in it about all troubles arising, the reasons for them, and methods of remedying them. Measures for preventing malfunctions of aviation equipment are developed on the basis of these data. Constant purposeful study of the informative material makes it possible for specialists to thoroughly and promptly analyze reasons for the appeareance of particular deviations and troubles and to be ready for any surprises.

For example, in inspecting a power plant Senior Lieutenant V. Petrov discovered a fuel pressure drop behind the pump-sensor. Initially the officer believed that specifically this machine unit had failed and decided to replace it, but Petrov changed his mind after carefully studying similar defects from technical information materials. He assumed that another pump connected with the first one was malfunctioning. This version was confirmed after a check. It turned out that one of its parts had failed after increased wear. And so a thorough analysis, proper approach to troubleshooting, and use of technical information helped the specialists remedy the defect which had appeared with quality, on time, and with optimum expenditures.

A matter of chance... We sometimes justify our mistakes with this popular expression, imagining the process of the appearance of troubles and method of remedying them to be some kind of unpredictable and thus uncontrollable moment. The experience of foremost collectives clearly indicates that using the proper troubleshooting methodology competently, constantly studying technical information, and arming each aviator with the experience of the best specialists serves as a support for aviation engineering service personnel in raising combat readiness of Air Forces units and subunits and in supporting flight safety.

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